SUPPLEMENTARY EDUCATIONAL MONOGRAPH,
JOURNAL OF EDUCATIONAL RESEARCH

# Results of Practical Experiments in Fitting Schools to Individuals

## A Survey of

# The Winnetka Public Schools

Under a Subvention
From the Commonwealth Fund

*By*

CARLETON WASHBURNE
*Superintendent of Schools, Winnetka, Illinois*

MABEL VOGEL
*Research Assistant, Winnetka Public Schools*

WILLIAM S. GRAY
*Dean of the College of Education, University of Chicago*

PUBLIC SCHOOL PUBLISHING COMPANY
BLOOMINGTON, ILLINOIS
1926

# TABLE OF CONTENTS

# INTRODUCTION

By William S. Gray

The investigations reported in this monograph were made to determine, within the limitations described in Chapter I, the effectiveness of the Winnetka technique of individual instruction. Such investigations are very appropriate in a decade when educational practices are being subjected to rigid scientific scrutiny. In fact, they are absolutely essential at all times in order to ascertain the advantages and limitations of given procedures and to determine needed changes. The unusual significance which attaches to studies of the results of individual instruction may be emphasized by reference to certain historical facts.

As early as 1868, William T. Harris, Superintendent of Schools, St. Louis, Missouri, vigorously challenged the validity of requiring all pupils to do the same amount of work and to advance at the same rate. Numerous investigations since that time supply conclusive evidence that children differ radically in the amount of work of which they are capable and in the rate at which they can complete given units. Furthermore, these studies show that many pupils do far more effective work in some subjects than in others and that a given pupil advances more rapidly in certain phases of a subject than in others. It follows that the rigid systems of grading and promotion which have been used almost universally in the past fail by their very nature to make adequate provision for individual differences among children.

Numerous attempts have been made to correct the evils inherent in traditional methods of grading and promoting pupils. For example, Harris recommended that the curriculum be organized into units so that promotions could occur every five weeks. According to his plan, pupils who were unable to proceed as rapidly as their classmates repeated only a relatively small part of a year's work. A second noteworthy effort to provide for individual differences was the Batavia Coaching Plan in which special help was provided for individual pupils as it was needed. A third plan involves variations in the amount assigned and in methods of conducting group recitations in order to provide more adequately for individual needs. Recent studies by Theisen and by Monroe reveal a clear recognition of the need of adequate provision for individual differences by both elementary and high-school teachers.

Without stopping to recount all types of modifications which have been attempted, reference will be made next to efforts to reorganize the materials and methods of instruction so that pupils may advance according to their capacity. The need for this type of adjustment was recognized years ago when the Pueblo plan of individual instruction was tried out. The first well-organized effort to individualize instruction originated at the San Francisco State Teacher's College. The technique developed there has been adapted to public school conditions and is in use in a number of school systems. It has doubtless been given a more thorough trial at Winnetka than in any other public school system in the country.

A detailed description of the program of individual instruction and progress as exemplified in the Winnetka schools is given in Chapter II. It will suffice at this point to call attention very briefly to five basic principles underlying the Winnetka technique. They are (1) a clear definition of the essentials of the fundamental subjects in terms of units of achievement; (2) self-instructive, self-corrective practice materials in these subjects; (3) diagnostic tests to measure achievement; (4) individual subject promotions, within certain limits, on the basis of achievement in the fundamental subjects; (5) and large emphasis on group and creative activities during certain periods of the day. After four years of constructive work on this program of instruction, Superintendent Washburne concluded that the time had arrived for a careful study of its advantages and limitations.

A thorough investigation of the merits of the Winnetka program of instruction includes the study of a variety of interesting and complex problems. Without doubt, the fundamental question which should be considered relates to the organization, content, and methods of teaching that will provide the best possible education for each and every boy and girl. Some of the more specific problems follow: What is the total effect in terms of knowledge, attitudes, habits, and skills of individual instruction as compared with group instruction? Does one type of instruction secure given results more effectively than the other? Since individual instruction implies differences in rates of progress, is the work so organized that the child is confronted at each level of advancement with units of work in all subjects that require essentially the same degree of intellectual maturity?

The fact that wide provision is made for group and creative activities in Winnetka is evidence that the value of group instruction is recog-

nized. This being the case, is it more effective to provide activities on the one hand in which individual work predominates and on the other hand activities in which group activities are emphasized, as is true in Winnetka, or is it better to make use of both individual and group work, as occasion may demand, in practically all school activities?

With regard to the individualized subjects, the following questions arise: Can the so-called fundamentals be learned more rapidly and effectively as drill exercises apart from their natural setting? Do pupils learn when to use facts and do they recognize their social significance as well when the facts are taught in individual self-corrective exercises as when introduced in their natural setting? Does individual or does group instruction make the better adaptation to differences in learning capacity? What is the amount of time required in learning fundamental facts by each method? Do some pupils learn more effectively under the stimulus of group activities than when working alone? Do pupils give better attention to their work when engaged in group or individual activities? Are there advantages in group instruction that compensate in part at least for failure to adapt teaching effectively to differences in rates of learning? Is a combination of group and individual instruction in learning facts and in learning how and when to use them more effective than the exclusive use of either method?

With regard to the creative activities the following questions are significant: (1) What are the objectives of group and creative activities? (2) Are there certain fundamentals or invariables, such as honesty and coöperation, which should be mastered as thoroughly as any of the facts of arithmetic or spelling? (3) Are these fundamentals defined as clearly and definitely as the units of achievement in the individualized subjects? (4) Can some of these fundamentals be mastered more effectively through a combination of group and individual instruction than through the exclusive use of either technique? (5) Are the creative activities so organized that each step leads to successively higher levels of achievement, as is true in the case of the practice exercises in arithmetic?

Certain problems of an administrative nature also arise. For example, (1) is the amount of retardation and of acceleration greater in group or individual instruction? (2) How do pupils who have been taught by group methods compare with those of the same mental and chronological ages who have been taught by individual methods? (3) Do socialized and self-expressive activities receive more or less time in a program

of individual instruction than in regular group instruction? (4) Does such a program of teaching impose a greater or less burden upon a teacher than group instruction? (5) How does the cost of education compare under group and individual methods of teaching?

As a profession we are committed to an intensive study of all these problems. An adequate solution of them will require the coöperation of many investigators for a long period of time. The resources available for the studies reported in this monograph were very limited. Consequently, only a small number of the questions which ultimately must be answered could be studied at this time. The investigation reported in this monograph is, therefore, not a complete study of all relevant problems, but rather one of a series of studies that must be made in order to determine the advantages and limitations of individual instruction. Nevertheless, the findings are very significant.

The total effect of the Winnetka technique, as measured by the standing of pupils in a high school, where class instruction predominates, is somewhat superior to that of the public elementary schools which send pupils to the same high school. Whether the superiority of the Winnetka pupils should be attributed to the individual instruction which they received, to the group and creative activities in which they engaged, or to other influences are not revealed by this investigation. The fact remains, however, that whatever may be the advantages and limitations of the Winnetka technique, pupils from that school system are able to compete successfully in a neighboring township high school with pupils from other school systems. There is need of additional studies to determine specific elements of strength and weakness of pupils trained by group methods of instruction and by the Winnetka technique. The responsibility for such studies must be shared equally by the proponents and opponents of individual instruction.

The results indicate that the mastery of the fundamental facts in arithmetic, reading, and language, as measured by standardized tests, is facilitated somewhat for most pupils by the Winnetka technique. In the case of certain pupils there is tremendous saving of time. Such economies in the mastery of drill phases of given subjects provide more time for group and creative activities in school work. Furthermore, individual instruction by its very nature makes possible more effective adaptation to differences in capacity to learn. These two advantages are so significant that they cannot be disregarded. An important question which this investigation could not undertake to answer because of

limited time and resources relates to the merits of adopting the specific steps prescribed by the Winnetka technique as compared with modifications in group instruction to provide for individual differences in capacity to learn. Whatever may be the ultimate answer to this problem, the results of the studies reported in this monograph seriously challenge the validity of group instruction which fails to make adequate provision for individual differences.

Again, the studies in this monograph show that individual instruction, as exemplified in Winnetka, is administratively possible. No additional cost seems to attach to the support of this type of education. In fact, if the decrease in retardation is considered, there is some evidence of its greater economy. Furthermore, the burden placed upon the teacher is by no means excessive.

The discussion thus far shows clearly that certain advantages attach to the Winnetka technique of instruction in the mastery of specific phases of certain school subjects. No claim is made, however, that the Winnetka technique is, therefore, necessarily the most effective procedure to use in elementary or high schools. The study is too limited in scope and there are too many unanswered questions to justify such claims. Specific limitations of the study are referred to in various chapters of the monograph. These findings are to be used in a constructive reorganization of certain practices in the Winnetka schools.

Reference has already been made in earlier paragraphs to problems of major importance which must be investigated in order to reach final conclusions concerning the relative merits of group and individual instruction. The solution of these problems will require systematic, coöperative effort on a nation-wide basis. In this great enterprise each school system is under obligation to scrutinize its methods and the results of its instruction analytically and thoroughly. The findings reported in this monograph justify the statement that the burden of proof rests very heavily on those who complacently follow traditional methods of grading and promoting pupils and who make little or no adaptation of instruction to differences in capacity to learn. It is hoped that this study will be followed by many others until sufficient evidence accumulates to distinguish clearly the relative merits of various techniques of instruction in use today. As such a body of evidence accumulates it will be possible to select the method or methods which will secure desirable results most economically and effectively for all pupils.

# CHAPTER I

## THE PROBLEM STATED

The public schools of Winnetka, Illinois, have modified their curriculum and their administrative procedure to accomplish two purposes, namely, to make much greater adaptation to individual differences than is customary in public schools, and to provide more time for socialized and self-expressive activities. It seemed advisable, about two years ago, to make a series of careful quantitative studies of the results of these modifications. The survey which is reported in this monograph was undertaken, therefore, for the specific purpose of attempting to evaluate the results of individual instruction as carried on in the Winnetka schools.

The specific problems which the survey attempted to answer were ten in number:

(1) Does the Winnetka technique result in more or in less retardation of pupils than is found in other schools of similar social composition? Does it result in unusually rapid advancement of many pupils?

(2) Does the Winnetka technique actually provide for individual differences among children? Does the school progress of children in Winnetka correlate with their intelligence?

(3) Are the children in the Winnetka Public Schools so selected as to make generalizations from them inapplicable to other schools? More specifically, what are the mental ages of Winnetka children, grade by grade, and what are their intelligence quotients?

(4) Are those subjects which are being taught on an individual basis in Winnetka learned more effectively or less effectively than in schools using the usual class method? This question is raised specifically with respect to silent reading, oral reading, spelling, formal language (punctuation and capitalization) and the mechanics of arithmetic (both speed and accuracy).

(5) Do children who have had their elementary training under the Winnetka technique do satisfactory work in the high

school? Are they able to compete successfully, so far as marks are concerned, with children who have been taught by the usual group methods, when all work together in a typical high school?

(6) Are individual progress and self instruction, *per se,* more efficient or less efficient than group or class instruction, as shown by controlled experiments?

(7) Is the proportion of children apparently concentrated on their work greater or less under the Winnetka technique than under ordinary class procedure?

(8) Do the pupils in the Winnetka Schools devote more time or less time to group and creative activities than do those in a typical public school system using the class method, or those in a private experimental school, or those in a university laboratory school?

(9) Does the Winnetka technique impose a greater burden on the teacher than does regular classroom instruction?

(10) Is the system of individual instruction and progress responsible for the per capita cost in the Winnetka Public Schools, which is higher than that in most public schools?

Some of these problems have also been attacked by other investigators in other schools. The late Frederic Burk at the San Francisco State Teachers College, Stuart A. Courtis in Detroit, Ernest Horn at the University of Iowa, A. H. Sutherland in the Los Angeles Public Schools, and Jessie Mackinder in London, have been among the leaders in such investigations.[1]

These ten problems were all that could be undertaken during the course of a year with the resources that were available. It is evident that many problems, the study of which would be desirable, have not been included in this survey. For example, no studies were made of the effectiveness of the Winnetka technique in teaching the content subjects, such as history, geography, civics, and physiology. The curriculum in the Winnetka Schools differs so widely in these subjects from that of other schools, that at the present time a comparison of achievement would be al-

[1] See the *24th Yearbook, Part II, National Society for the Study of Education,* Public School Publishing Co., Bloomington, Ill., 1925.

most impossible. There is also a dearth of satisfactory achievement tests in these subjects.

Furthermore, neither the ability to apply the mechanics of arithmetic to the solution of real problems in life, nor the ability to apply knowledge of spelling, punctuation, and capitalization to the writing of compositions, nor the ability to organize content or other material for presentation has been studied in this survey. Neither have we any adequate measure of the quality of the group and creative activities. Neither do we know how far the group work serves or should serve as a motive for the individual work, nor how far the individual work carries over into group and creative activities. Nor, again, do we know how much, if at all, the effectiveness of the individual work would decrease with larger classes or increase with smaller classes.

And so on through the wide range of problems suggested in Dr. Gray's *Introduction.* The fact that we have not studied all these issues does not indicate failure to recognize their importance, neither does it indicate that a study of them would reveal either weakness or strength in the Winnetka Schools. Unfortunately, we do not know with exactness how any school system is functioning in most of these particulars, for few of them have been studied thoroughly in any school survey: they are lines of research which the Winnetka schools, in common with others, should undertake.

At the risk of repetition, then, let it be emphasized vigorously that the problems attacked in the present survey represent but a fraction of the studies which must be made in determining the merits of any program of instruction. An effort was made, however, to select important problems, to delimit them clearly, and to investigate them with sufficient thoroughness to yield definite and reliable results. In some cases the data are inadequate to justify final conclusions; these limitations are indicated in the detailed discussions in some of the chapters that follow. In other cases data were secured which are decidedly significant, if not entirely conclusive.

In order to carry out this survey, the Commonwealth Fund of New York was asked to grant a subvention sufficient to employ a research worker and one or two clerks for the year 1923-24 and to secure expert advice concerning the details of the proposed study. From a practical point of view the scope of the survey was determined primarily by the resources which the subsidy provided.

Dean William S. Gray of the College of Education of the University of Chicago agreed to act as advisor for the study. Miss Mabel Vogel was appointed research worker. Miss Vogel was familiar with Burk's work in San Francisco and with various European experiments in individual instruction. She had also been a classroom teacher in the Winnetka schools and had carried out a careful piece of curriculum research. The organization and direction of the investigation, were undertaken by the Superintendent of the Winnetka schools, with Dean Gray as advisor.

The investigation was a continuous survey, covering a school year. Furthermore, it was a comparative survey, for it included one other school system and two special schools.

Much thought was devoted to the choice of these other schools. For one, a public school system in a suburb with almost exactly the same population and social composition as Winnetka was selected. This public school system is referred to throughout the report as School I. Second, a progressive experimental private school, long known for the high standard of its socialized and self-expressive activities, was chosen as representing certain of the ideals which the Winnetka schools seek to attain. This private experimental school is referred to as School II. The laboratory school of a large university was also selected for comparison, since it, like the Winnetka schools, attempts to embody the most recent results of scientific research in the educational field and to carry out scientific experiments within the school itself. This laboratory school is referred to as School III.

In comparing Winnetka with the other three schools numerous safeguards were taken to guarantee entire fairness in each

of the studies. For example a disinterested witness was employed to be present whenever tests were given.[2] Furthermore, all the studies were made by the same person in order to keep the personal factor constant.

In Chapter II there is a description of the Winnetka schools and of their special technique of individual instruction and progress, balanced by group and creative activities. In the remaining chapters there are detailed discussions of the several problems that were studied during the survey.

[2] The witness was Mrs. Homer Rainey, a university graduate and experienced teacher, whose husband, now an instructor at the University of Oregon, was at the time doing graduate work at the University of Chicago. She was selected for this work by Dean Gray.

# CHAPTER II

## THE WINNETKA SCHOOLS AND THE WINNETKA TECHNIQUE

Winnetka is a suburb of Chicago on the shore of Lake Michigan, with a population of 10,000. It is known for its strong community spirit and the interest its people have taken in their schools. Thus, it possesses the only public school building in the United States erected by popular subscription; it contains one of the first and best community houses; it has a municipal bathing beach, a municipal golf course, and other evidences of the public-spiritedness of its citizens.

The assessed valuation of Winnetka is about $6,000,000, although this is only about one-eighth of the actual value of the property. The school tax for the elementary schools is 4 percent of the assessed valuation, or about a half of one percent of the real value. The township high school levies an additional tax, not quite as large as that of the elementary schools, but draws its revenue from the four villages of the township, Glencoe, Winnetka, Kenilworth, and Wilmette.

While there are a number of people of wealth in Winnetka, and many people with comfortable homes of their own and adequate incomes, there are also the local tradespeople—typical of tradespeople in a small town—and there are various types of day laborers. There has been a small but steady influx of newly arrived immigrants from foreign countries largely Italians, Swedes, and Czechs. The school population is, therefore, quite heterogeneous, but with a somewhat higher percentage of children from good homes than would be found in most American communities. As shown in Chapter V, the median intelligence of Winnetka children is only slightly above average.

There is a democratic atmosphere in Winnetka. It is not unusual to see the son of a wealthy broker seated beside the son of his chauffeur in school and the two boon companions out of

school, nor even to see the daughter of a colored cook playing with the daughter of her mistress. Financially and socially the pupils range from the child who has to be sent home for a bath or has to be furnished with clothes to come to school to the child who is driven to school each morning by a liveried chauffeur in a limousine; mentally they range from a child of such low mentality as to be practically an institutional case (intelligence quotient of 50 to 60) to the genius with an intelligence quotient of 190.

Winnetka has four schools: three lower grade buildings, running from the kindergarten through the 6th grade, and one 7th-and-8th grade junior high school. The senior high school, as already mentioned, is a township high school which, though situated in the southern part of Winnetka, is controlled by a board of education and superintendent entirely independent of the Winnetka board of education and superintendent.

The Winnetka board of education has for many years been composed of high-minded, intelligent, public-spirited persons with no political ambitions or bias. These persons have served on the board of education out of public spiritedness and out of a sincere desire to make their schools as good as possible. This board of education invited the present superintendent to come to Winnetka in May, 1919, with the avowed purpose of making the schools modern and progressive. The superintendent has, therefore, had the sympathetic support of the board of education in all his undertakings.

It was under these favorable conditions that the Winnetka schools were reorganized to provide for individual progress, a large measure of individual instruction, and considerable emphasis on socialized and self-expressive activities.

The curriculum in the Winnetka schools is divided into two parts—"the common essentials" and "the group and creative activities."

"Common essentials" are supposed to include those knowledges and skills which will be used by practically everyone—a certain speed and accuracy in arithmetic; the ability to use the

common forms of punctuation and capitalization correctly; the ability to write legibly and with reasonable speed; the ability to read with a certain degree of speed and comprehension; the ability to spell correctly the most commonly used words; information concerning commonly known persons, places, and events; and ability to discuss intelligently the outstanding civic, social, and industrial problems confronting the American people.

"Group and creative activities," on the other hand, include those things in which the results achieved by the children may legitimately differ—the appreciation of literature, music, and art; playground activities; assemblies; handwork of various kinds; projects which are an end in themselves rather than a means to the mastery of subject matter; dramatizations; discussions (again not for the purpose of learning common essential facts); and much of the color material and background of history and geography.

While there are necessarily many inter-relations between these two divisions of the curriculum and while, so far as the child himself is concerned, one merges naturally into the other, in the administrative organization of the schools and the method of treatment these two divisions are fundamentally distinct.

Progress in the common essentials is strictly individual. Each child progresses through each unit of work at his own rate. He stays on one phase of the work until he masters it and then goes on to the next. The time required by the child to finish each particular unit of any of the common essentials varies greatly. The units of work are distinctly units of achievement, not units of time.

In these common essentials there is a form of differentiation of assignment, but it is in one respect the exact opposite of the typical differentiated assignment. Whereas differentiated assignments in many schools mean that the bright child does more work than the slow child, in the Winnetka schools they are likely to mean that the bright child who can master a process or a subject quickly is allowed to progress with a minimal amount of prac-

tice work, while the slow child who needs much drill may do three or four times as much practice work.

Except in speed in arithmetic, the standards of achievement are the same for all children. When a child has reached standard he moves on to the next unit of work. There are, of course, reviews and a child must reach standard repeatedly.

The general technique by which this individual progress is brought about consists of (a) breaking up the common essentials curriculum into very definite units of achievement, (b) using complete diagnostic tests to determine whether a child has mastered each of these units, and, if not, just where his difficulties lie, (c) and the full use of self-instructive, self-corrective practice materials.

The units of achievement are called "goals." These goals are specific. Instead of saying, for example, that a child must learn column addition during third grade, the Winnetka schools say that the child must be able, before leaving third-grade arithmetic, to add columns three digits wide and four digits high at the rate of three in three minutes with one hundred percent accuracy. An effort has been made to define each goal in each of the common essentials with equal definiteness.

These goals are printed in abbreviated form on a large card supplied for each child. As a child progresses from one goal to the next, the date of completing each goal is recorded by the teacher on this goal card. At the end of each 6 weeks the child connects the last recorded dates of all subjects with a red line. Thus his progress by subjects and as a whole is graphically shown from one six-week period to the next. On the back of the goal card the child's group-spirit, orderliness, initiative, etc., are indicated by check marks after appropriate descriptive paragraphs. This goal card with full explanation of the various goals, is sent to parents in lieu of the ordinary report card.

The tests used to determine whether a child has reached his goals have for the most part been prepared in the Winnetka schools. The earliest forms of these tests were prepared in 1917, 1918, and 1919 under Frederic Burk at the San Francisco State

Normal School. These have been repeatedly revised and expanded by the teachers in the Winnetka schools until there is now a complete set of tests in arithmetic and language from the earliest grades through the eighth. Methods of testing spelling and writing on the same general basis have also been worked out, and a full set of tests in history and geography is under way. For silent reading the Burgess Scale for Measuring Ability in Silent Reading and the Reading Examination of the Stanford Achievement Test are used; for oral reading the New Standardized Oral Reading Check Tests by W. S. Gray.

The Winnetka tests, especially those in arithmetic, language, and history-geography, have been so devised that each is complete, in that it covers every element of the particular unit being tested. The column addition test, for example, contains all the one hundred possible addition combinations. A formal language test includes every element of punctuation and capitalization that has been taught up to the time the test is given.

These tests have also been so devised as to be diagnostic. Any one question or any one example presents, so far as possible, just one difficulty. To use the column addition test for illustrative purposes again, each single vertical column contains just one group of three combinations. A key letter in the answer shows the teacher and the pupil at a glance which group of combinations needs practice if the pupil has failed to get the correct answer. A long division test contains one example for each type of long division difficulty. A history-geography test includes every person, place, or event about which the child is expected to have learned in the factual side of this tested unit of his history-geography work.

Leading up to the tests and providing material for remedial practice work where tests have not been successfully passed, is a series of self-instructive practice books. These books have been written by classroom teachers in the Winnetka schools and edited by the superintendent. They have been mimeographed, tried, revised, and re-mimeographed two or three times. There is a complete set of such mimeographed books in arithmetic and

formal language, and a set in history-geography is being developed. For reading, a wide range of books are required in each grade. Most children read not fewer than fifteen books to the grade. The spelling method is described in some detail in a later part of this report. (See page 94.)

One of the characteristic features of the practice materials is that they are written directly to the child as if they were to constitute a series of correspondence lessons. They lead the child step by step very gradually from the elements he knows to the elements he is to learn. The child practices on each step until he masters it. Then he goes on to the next.

The teacher, of course, helps the children as individuals and as groups; occasionally, she may even present a topic to the entire class when this may be done without detriment to the pupil and with economy to the teacher. She is giving help and encouragement wherever she finds it needed. A good teacher is as real and necessary an influence in this system as in any other.

The practice books are self-corrective. Each child corrects his own daily work by comparing his answer with the answer in the back of the practice book. This daily work is not marked and has nothing to do with promotion, except in so far as it prepares the child for the tests.

The tests are corrected by the teacher. When they are successfully passed, the date is recorded on the child's goal card and in the corresponding goal record book kept by the teacher.

A "grade" in Winnetka means a certain group of goals in each subject, corresponding approximately to the work usually accomplished by children of that grade in other schools. Third grade in Winnetka does not necessarily mean the third year that the child is in school. It does mean that set of work-units (in the "common essentials") which corresponds with the work usually done in third grades of other schools.

A pupil in Winnetka may be doing work in two, or even three, grades at the same time in different subjects. Since his progress in the common essentials is strictly individual, it is entirely possible for him to complete fourth-grade arithmetic, for example,

in March, fourth-grade reading in June, and still to have some fourth-grade language to do the following September. It is somewhat common for a child to be doing work in two different grades, but rare for him to be doing work in three; for if a pupil's most advanced subject is more than a grade beyond his most retarded one, he drops the most advanced subject for the time being and spends double time on the most retarded one. A certain approximation to evenness of advancement thereby results.

The room in which a child sits is not determined by any set formula. In general, children sit with others of approximately their own age and roughly, the same general degree of grade advancement. Wherever a child seems not to fit the environment in which he is placed, he may be freely transferred at any time of the year to a younger or to an older group. His individual work in the common essentials will be entirely unaffected by such a transfer.

In any one classroom children will be found at many stages of advancement. At least two, and sometimes three, grades of work will be found exemplified in one or more subjects in practically every classroom.

Grade repetition is an impossibility under the Winnetka plan. A child continues to work toward each goal until he reaches the standard of that goal. He then proceeds to the next. If a child requires a year and a half to complete a year's work in one subject, he may take a year and a half. But he will do no repeating. A child may sit in the same classroom two successive years (whereby some of his socialized activities will be duplicated), but in the common essentials his progress will be individual and continuous.

The socialized and self-expressive activities—or group and creative activities, as they are more accurately termed—are handled in an entirely different way. Here time is the relatively constant factor, while achievement varies from child to child. Here there are no set standards; for the most part no pre-determined formal preparation; no tests. These activities are largely an end in themselves. They do not affect the child's grade prog-

ress. They occupy on the program about half of each morning and half of each afternoon. These group and creative activities usually grow out of the children's interests or out of their history-geography work.

In order to make it possible to use history-geography as a basis for many socialized activities, progress in this primarily social subject is not as strictly individual as in other subjects. True, each child masters each section of his history-geography material quite individually, but having done so he does not proceed to the next section of it until the other members of his class are also ready to proceed. While he is waiting for the others, he may either do special assignments in this same field or use his history-geography time for the more completely individualized subjects, such as arithmetic, language, spelling, writing, or reading.

Some account may be given here of a number of these group and creative activities:

*Discussions.* Discussions differ from recitations in that there is no attempt in a discussion to discover whether a child has or has not studied any particular lesson. In a discussion there is room for difference of opinion—there is a real problem. Frequently, discussions grow out of the material which children are handling in their individual work. This is particularly true of social science, which is the basis of many discussions and other socialized activities. In their discussions of history-geography and civic problems and even in their discussion of certain types of arithmetic work, the children have opportunity to experience the impact of mind on mind, to learn to speak freely and spontaneously.

*Self-government.* Each school in Winnetka is organized on some plan of self-government. There are assemblies presided over by children and conducted in strictly parliamentary form. There are committees with definite responsibilities in the conduct of the school—care of plants committee, committee on the care of the grounds, committee on playground rules, assembly program committee, etc. Work on these committees, participa-

tion in the self-government of the child's local classroom, and participation in the business meetings of the entire assembled school, present opportunities for self-dependence, discussion, quick thinking, responsibility, and freedom in speaking before large numbers. These opportunities are considered by the Winnetka schools to be one of the outstanding features of the Winnetka technique.

*Dramatics.* Much use is made in the Winnetka schools of dramatics, ranging from exceedingly informal, impromptu, classroom dramatizations to fairly elaborate public performances depicting great events in history or reproducing literary masterpieces. Much of the work in dramatics is correlated with social science, some of it with literature. While there is probably a good deal of incidental instructional value in the dramatics, their chief purpose is to train children to work together—to give the fullest possible opportunities for socialization and self-expression.

*Projects.* Projects in the Winnetka schools differ from "the project method" often advocated in that they are in no sense a means to some instructional end. When there are facts or skills to be taught, these are handled individually. The need for these facts and skills may be brought clearly to the pupil's consciousness through a project, or the child may be given many opportunities to apply his academic knowledge or skill in carrying out the projects. But these two results, while desirable, are incidental. The purpose of the projects lies within the projects themselves. No strained effort is made to 'bring in' various types of academic subject matter. When, for example, the children get out, as they do, a school newspaper, its purpose is not training in spelling, punctuation, editing, composition, printing, or proof reading, although the child undoubtedly gets practice in all these fields. The children issue the newspaper because they enjoy doing it, because it affords them an avenue through which to express their ideas. From the teacher's standpoint the purpose of *The Journalist* is to train children in the habit of coöperation, to help them discover, through the division of labor and coöperative effort, their interdependence.

*Assemblies.* The assembly programs are worked out by the children themselves, who preside over most of them. They afford an opportunity for pupils of several grades to come together from one to five times a week (varying with the school) for discussions, dramatizations, self-government, musical programs, community sings, or to hear an outside speaker or one of their number recount an interesting experience. In their assemblies the children have practice both in being part of an audience and in addressing an audience. Even little children in the first, second, and third grades participate actively in the assemblies and in the management of them.

*Hand Work.* From sand table work, plasticine, cutting and pasting, and block building in the lowest grades up through the junior high school, with its well-equipped shops for woodworking, printing, art metal crafts, art, pottery, sewing, cooking, and general science, there is an effort to train children in the skillful use of their hands and to give them an opportunity for creative work. There is not much dictated or formally organized work in these fields. The materials and the opportunity are provided. The child may use them according to his own interests and ability.

There is some individual hand work with definite goals in the upper grades, particularly in sewing and cooking. Here the work ceases to be purely self-expressive and becomes the mastery of a commonly needed knowledge and skill. Certain preliminary parts of the junior-high-school shop work are also on an individual basis, in that there are common goals which must be reached by every child. Thereafter, the work is purely creative or self-expressive, with no common requirement.

*Art and Music.* Most of the work in art and music is social or self-expressive. A certain amount of technical music is taught. This has not yet been individualized, although it logically should be. This technical work is handled on a class basis during certain parts of the year in some of the upper grades (chiefly fifth and sixth) and does not differ widely from that of other schools. The main purposes, however, of music work in Winnetka are:

first, to give children a means of expressing through song any mood or emotion; second, to expose them to a great deal of thoroughly good music, developing their musical appreciation; and third, to develop the group spirit that comes through community and choral singing.

The art work, too, has a certain technical side, which, unlike music, has been individualized and is carried on according to the same general technique of definite goals and self-instruction which characterizes other individualized subjects. Nevertheless, the art work is mainly for self-expression. Children are given innumerable opportunities to express through art various ideas. The art department correlates its work with other socialized and self-expressive activities in many ways. When the children are dramatizing a bit of history, for example, the art department helps them in the designing of their costumes and the making of their stage properties. In the publication of the school paper the art department helps by giving opportunities for the making of wood cuts and stereotypes for illustrations. The purposes of the art work are: first, the giving of free opportunity for creative work and self-expression; second, specific training in harmonious dressing and interior decoration; and third, development of the appreciation of the beautiful.

*Physical Education.* While the corrective gymnastics phase of the physical education work is individual, both in the sense of providing for special and individual needs and in the sense of attempting to bring children to a common minimal standard of physical efficiency, most of the physical education time is used for the development of group spirit through team play. Children go out to their physical education work at different times of the day, so that there are seldom more than two grades on the playground at a time. Each school playground is provided with a trained physical education teacher, who organizes the activities of the children. Opportunities are given on the playground for the development of ideals of sportsmanship, ideals of self-sacrifice for the good of the whole, ideals of coöperation, and ideals of persistence. Opportunity is, of course, also given for a great

deal of health-producing physical activity. Some opportunity is given for self-expression, both during the periods of free play and in the choice of group activities.

The above list of "group and creative activities" is not exhaustive, but will indicate the sort of activities which take place in the Winnetka schools about half of each morning and half of each afternoon. The other half of each morning and each afternoon, of course, is given over to the individual work in the common essentials.

The work in the first six grades is not departmentalized. In the junior high school, of course, there is complete departmentalization. It is in the junior high school that pupils who have gone through the lower grades unusually fast may use their saved time for broadening and enriching their education. Some thirty-five electives and special subjects are offered in the junior high school. A child is not graduated to the senior high school until he is considered ready not only academically but physically and socially.

Having now described the plan of administration and the arrangement of curricular matter peculiar to the Winnetka elementary schools, we may proceed in the following chapters to the answers to our series of questions relative to the effect of this plan upon the achievements of the Winnetka pupils.

# CHAPTER III

## THE AGE-GRADE CENSUS

Does the Winnetka technique result in more or in less retardation of pupils than is found in other schools of similar social composition? Does it result in unusually rapid advancement of many pupils?

One of the first and simplest ways of measuring the efficacy of the Winnetka schools consisted of taking an age-grade census of Winnetka, and a similar one for the three adjoining suburbs and for a university laboratory school. The census was taken at approximately the same time, by exactly the same method, and by the same person in all these systems. The Bachman method of determining the normal age for each grade, as used in the Gary survey, was employed. According to this method, a child who was 6, but not yet 7, on August 15th, should be in Grade I when school opened in September. Similarly, a child who was 7, but not yet 8, should be in Grade II. A child 7, but not yet 8, in Grade I was counted as one year retarded, a child of the same age in Grade III was counted as one year advanced. "Normal" ages for each grade are thus as follows:

| Age in Years | Grade |
|---|---|
| 6, but not yet 7 | I |
| 7, but not yet 8 | II |
| 8, but not yet 9 | III |
| 9, but not yet 10 | IV |
| 10, but not yet 11 | V |
| 11, but not yet 12 | VI |
| 12, but not yet 13 | VII |
| 13, but not yet 14 | VIII |

Because of the system of individual subject promotions prevailing in Winnetka, the exact grade of a child is obviously difficult to determine. For example, while a child in most schools is just starting the fourth grade in September, a Winnetka child may have started fourth-grade arithmetic the previous March, fourth-grade reading the previous January, and may still be doing some third-grade work in language. Consequently, a method

had to be found for determining the 'average grade' for each child. This method was as follows:

The child who began 4th-grade arithmetic on the first of March had had approximately four months of 4th-grade work when school opened in September. Since the school year in Winnetka is nine months long (thirty-seven weeks), and since the majority of children in Winnetka progress at the rate of a grade a year, such a child would be considered as having completed $\frac{4}{9}$ of his fourth-grade work. He is, therefore, in grade 4.44 in arithmetic. Similarly, the child who began 4th-grade reading on the first of January is in grade 4.66. The child who has been in 3rd-grade language for more than a year and has not yet completed it, is counted as being in grade 3.9 until he is finally promoted to grade 4.[1] Similarly, a child's grade in each subject is figured and the average for all of these subjects is taken as his average grade.[2]

Even after determining the average grade of each child, we still had an obstacle to overcome. Winnetka children had average grades widely scattered—3.5, 3.6, 3.7, 3.8, 4.2, 4.3, etc.; but in September the children of all the other schools were either just beginning Grade 3, or just beginning Grade 4, or just beginning some other grade. It, therefore, became necessary to consider as "3rd grade" all those children whose average grade was between 2.5 and 3.4. Similarly, those whose average grade ranged between 6.5 and 7.4 were considered as 7th-grade children.

It was necessary to use some such range of grade as this, since the number of children whose average grade was exactly 3, for example, would be too small to be significant. By grouping together the children who were half a year or less beyond 3rd grade and those who were half a year or less behind 3rd

[1] It is possible, of course, that the child counted as in grade 3.9 may be several months from the completion of his work in that grade. This is compensated for, however, by the child who after four months' work in a subject has practically completed the work of the grade. Our records show that there are more of the latter than of the former type. This system of grading, therefore, tends to give the Winnetka children a slightly lower, rather than a higher grade, than they should have.

[2] The subjects used in computing average grades were arithmetic, reading, language, history-geography, spelling-writing.

grade, we secured a group which would usually average approximately grade 3.[3] Since in the ordinary school many children are promoted on work that is recognized as not being up to standard and other children are promoted who are distinctly above standard in their work, it is probable that the range of ability and academic achievement represented in the typical third grade would be approximately as great as the range included between grade 2.5 and grade 3.4 in the Winnetka schools.

After having determined the number of under-age, over-age, and normal children in each grade according to the standards which have been described, the results were totaled and the percentages found for each school.

TABLE I.—PERCENTAGE OF RETARDATION AND ADVANCEMENT IN WINNETKA, COMPARED WITH THAT IN FOUR OTHER SCHOOLS

| | Per cent Retarded | | | Per cent "Normal" or "At Age" | Per cent Advanced | | |
|---|---|---|---|---|---|---|---|
| | Over 2 Yrs | Over 1 Yr Not Over 2 | 1 Yr and Less | | 1 Yr and Less | Over 1 Yr Not Over 2 | Over 2 Yrs |
| School I... | 0.5 | 3 0 | 11.0 | 51.0 | 31.0 | 2.7 | 0 2 |
| School III... | 0 4 | 1.8 | 20.0 | 52.4 | 25 0 | 0 4 | 0.0 |
| School IV... | 1.0 | 6.0 | 22 0 | 53 0 | 18.0 | 0.5 | 0.0 |
| School V.. | 2.2 | 4 8 | 16 0 | 44.8 | 30.7 | 1.0 | 0 0 |
| Average .. | 1.0 | 3 9 | 17.3 | 50.3 | 26.2 | 1.1 | 0.05 |
| WINNETKA | 0.4 | 2.4 | 11.6 | 55.7 | 26.5 | 3 0 | 0.01 |

Table I and Figure I show clearly that there is distinctly less retardation in the Winnetka schools than in schools using the class method or even the semi-individualized method employed by School III. Furthermore, when one eliminates from consid-

[3] In considering all who are in grade 2.5 to 3.4 as third-grade pupils, all in grades 3.5 to 4.4 as fourth-grade pupils, and so on, one assumes that there will be exactly the same number of children in the interval below 3.0 (2.5 to 2.9) as there are in the interval above 3.0 (3.1 to 3.4), and that there will be the same number of children in the interval below 4.0 (3.5 to 3.9) as there are in the interval just above 4.0 (4.1 to 4.4), and so on through the grades. A check of the actual data shows this to be the case. Forty-eight percent are exactly at their respective grades; 26 percent fall from 0.1 to 0.5 of a grade below the grade in which they are counted, and 26 percent are from 0.1 to 0.4 of a grade above the grade in which they are counted. The method used, therefore, is valid.

eration those children who have been transferred to the Winnetka schools from other places during the last two years, the percentage of retardation drops from 14.4 to 13.

It might be argued that the low percentage of retardation in Winnetka is due to an easier course of study or lower promotion

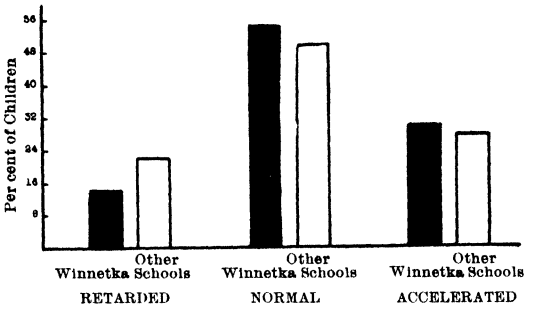



FIGURE I. AGE GRADE CENSUS

This graph shows the per cent of retardation, acceleration and normal progress of the Winnetka children as compared with the progress of the children from the four schools studied in Chapter III. Read the graph as follows: 14.4% of the Winnetka children were retarded while 22.2% of the children from the other schools were retarded. 55.7% of the Winnetka children made normal progress while 50.3% of those from other schools made normal progress. 29.6% of the Winnetka children were accelerated while 27.35% of the children from the other schools were accelerated.

standards. That this is not the case is clearly shown in Chapter VI, where the academic achievement of Winnetka children is compared with that of other schools, grade by grade. In these studies Winnetka children compare very favorably with those of other schools. Chapter VII, also, shows that Winnetka children who attend high school with children from other villages in the same township, more than hold their own. The low percentage of retardation is not due to low standards.

Probably the most important single cause of the low retardation in Winnetka, is the fact that grade repetition is entirely eliminated under the Winnetka plan. On the other hand, let it not be forgotten that each Winnetka pupil must do all the work of each grade and reach standard in each part of it; also that some pupils, on account of long absence through illness, etc., or on

account of entering school late, or on account of some degree of subnormality, will naturally not complete a grade's work in a year. This will explain at least a considerable part of the overageness that does exist. Whatever the complete explanation is, there can be no doubt but that the Winnetka technique tends to reduce retardation.

The percentage of Winnetka children "at age" is higher than in the compared schools. This, it is believed, is partly due to the fact that there is a definite effort in the Winnetka schools to use the full eight years of a child's elementary school life. In the first six grades this is partly brought about by the large amount of group and creative activity, shown in Chapter X of this report. In the 7th and 8th grades it is brought about by the large number of electives and special subjects introduced partly for this very purpose.

In further explanation of this point, children entering the junior high school decidedly below age are urged to take a large number of these electives and special courses rather than to graduate ahead of time. This plan differs from the class lock step, on the one hand, and from the "padding" type of differentiated assignments on the other. Children move through the common essentials strictly individually. Less time a day is given to these common essentials, however, than in many schools. And when a child has completed the common essentials, he does not simply do more work of the same kind. The junior high school provides a range of subjects from which a child may choose those which fit his own special needs or interests.

The fact that the percentage of children accelerated is just about average, by comparison with the other schools studied, will be a surprise to many who have looked upon individual instruction as a means of speeding up the educative process. The fact that this speeding up is not evident in these results is probably due, at least in part, to this effort to use the full elementary-school time of the children as has just been described. It may be partly due, however, to one or more of the following factors:

There is a tendency on the part of children, parents, and teachers to consider a grade a year as normal progress and

therefore, not to make the effort, in the case of bright pupils, to bring about a greater degree of progress. This same tendency probably also limits to some extent the number of over-age pupils. For both the unusually slow and the unusually bright pupils, however, it would operate more strongly under the class system than under the individual system, since the effort of class system schools is to keep children together. It is possible, too, that the Winnetka technique does not spur the brightest children to their utmost efforts. It is also possible that the average amount of acceleration, since individual instruction was fully established in the Winnetka schools, is less than 0.4 of a grade, in which case the method of computing accelerated progress would not show the pupils to be accelerated (a child of 4th-grade age whose average grade was 4.4 was considered "at age.")

The outstanding result of this study is the low percentage of retardation in the Winnetka schools; this appears to be due to the fact that children are allowed to progress individually and that grade repetition and failure thus become impossible. It cannot be due to the class size, since two of the schools compared have classes no larger, while the school that ranked next to Winnetka in low rate of retardation has the largest classes of the group of schools studied.[4] It is not, primarily, social composition, since the two schools with the largest amount of retardation have a more exclusive clientele and a higher median intelligence quotient. It does not appear to be due to superior teachers, since three of the schools with more retardation have higher paid teachers, and one of these schools has an unusual opportunity for selecting the very best available teacher material. The only distinctive factor in the Winnetka schools, by comparison with these others, is provision for individual progress and the elimination of grade repetition.

[4] That school (No. I) presents a rather puzzling problem, since its retardation is almost as low as Winnetka's in spite of distinctly class methods. It is a policy in that school almost never to 'fail' a child. The children are carried forward with their classes and the weak ones helped in many ways. By home work and by exceedingly good supervision, this school has made a remarkably good record in all our studies of academic achievement. It falls to the bottom, however, in socialized and self-expressive activities.

It is interesting to note how much less retardation there is in the average of schools with which Winnetka was compared than in industrial centers or big cities. The following table shows Winnetka as contrasted with Dubuque, Gary, Rockford, and Rochester, as reported in the Gary survey:

TABLE II.—PERCENTAGE OF RETARDATION AND ADVANCEMENT IN WINNETKA, COMPARED WITH THAT IN STILL OTHER CITIES

| | Percent Retarded | Percent Normal | Percent Advanced |
|---|---|---|---|
| WINNETKA ... | 14.4 | 55 7 | 29.6 |
| Gary . ... | 39.0 | 40 0 | 21 0 |
| Dubuque. ... | 33.0 | 49.0 | 18 0 |
| Rockford ..... | 37.0 | 42 0 | 21 0 |
| Rochester ... | 38 0 | 53 0 | 9 0 |

## CONCLUSIONS

1. The percentage of retardation in the Winnetka schools is unusually low.

2. The low retardation is probably due primarily to the individual progress feature in the Winnetka schools.

3. The Winnetka technique has not resulted in unusually rapid advancement; the percentage of children accelerated is only about two per cent greater than the average percentage accelerated in the neighboring schools studied.

# CHAPTER IV

## ADAPTATION TO INDIVIDUAL DIFFERENCES

Does the Winnetka technique actually provide for individual differences among children? Does the school progress of children in Winnetka correlate with their intelligence?

One of the first questions to be answered by the survey was whether the Winnetka technique was really making successful adaptation of public school work to the individual differences among children. In order to determine this it was necessary to make a detailed study of the progress of the children in typical individualized subjects and to see what relation, if any, this bore to their intelligence quotients.

First of all, the National Intelligence Test was given to all children in Grades IV through VII who had been in the Winnetka schools for two successive years. We then calculated the intelligence quotient of each child. While, of course, these group I.Q.'s were not so reliable for individuals as a Binet I.Q. would have been, they gave us a rough notion of relative intellectual ability.

On the basis of these tests, we divided the records of the children into four equal groups. The fourth of the children having the highest intelligence quotients, we called the "gifted group;" the fourth having the lowest intelligence quotients, we called the "low group;"[1] while the two middle fourths were lumped together to form the "middle group." The range of I.Q.'s and number of children in each group follow:

| | Number of Children* | Range of N. I. T., I. Q. | Median N. I. T., I. Q. |
|---|---|---|---|
| Gifted Group | 92 | 123–166 | 132.5 |
| Middle Group | 188 | 100–122 | 109 |
| Low Group | 93 | 60–100 | 92 |

*The quarters are not exact, because eliminations for incomplete records, etc., were made after the children had been divided into four equal parts.

[1] The "low group" being simply the bottom quarter contained a few children with I.Q.'s as high as 100.

We next made a detailed tabulation of the number of months required by each child to complete a grade's work in each individualized subject, and the average amount of time required by each child to complete a grade's work in all subjects. We took these records over a two-year period. Those children who had taken less than two years to complete two grades' work were considered "advanced;" those who had taken more than two years to do two grades' work were counted as "retarded." A child one month advanced is a child who has done two grades' work in a month less than two school years. A child nine months retarded is a child who has only done one grade's work in two years; that is, he is a whole year (nine school months) behind "normal" progress of one grade per year.

Tables III, IV, V, and VI and Figures II, III, IV and V, reveal the distribution of children's progress, both by typical subjects and by the average of all subjects.

Figures II, III and IV show the distribution of retardation and advancement of the three groups of children in arithmetic, reading, and language, respectively.

One striking feature of these distributions is their similarity. Reading, language, arithmetic, and general average of all school subjects, present essentially the same picture.

In all cases, the "gifted group" presents a distribution showing most of the children to be advanced. The "middle group" has as many or more children advanced as retarded, and the "low group" usually has a slightly larger number of children retarded than advanced. This is what one would naturally expect if children were allowed to advance in accordance with their intellectual capacity.

On the other hand, there is a wide overlap in all the distributions; about one-fourth of the children in the middle group and some even in the "low group" excel half of the children in the "gifted group." It occurred to us that this might be due to misclassification, owing to the inaccuracy of the I.Q.'s derived from a group intelligence test. The extreme cases in each distribution were, therefore, given the Stanford Binet Intelligence

TABLES III TO VI.—NUMBER OF PUPILS IN THE THREE GROUPS ARRANGED BY MONTHS OF RETARDATION OR ADVANCEMENT IN ARITHMETIC (TABLE III), READING (TABLE IV), LANGUAGE (TABLE V) AND IN AVERAGE STATUS FOR READING, ARITHMETIC, LANGUAGE, WRITING, SPELLING, AND HISTORY-GEOGRAPHY (TABLE VI).

| Table | Group | Months Retarded | | | | | | | | | | | | Normal | Months Advanced | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Over* | *10* | *10* | *9* | *8* | *7* | *6* | *5* | *4* | *3* | *2* | *1* | | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* | *13* | *14* | *15* | *16* | *17* | *18* | *19* | *20* | *21* | *22* |
| III | Gifted | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 1 | 2 | 27 | 15 | 10 | 3 | 3 | 7 | 5 | 8 | 1 | 3 | 2 | 1 | 1 | 0 | 0 | 1 | .. | .. | .. | .. | .. | .. | .. | .. |
| | Middle | .. | .. | .. | .. | .. | .. | 2 | 6 | 7 | 4 | 4 | 13 | 67 | 31 | 21 | 6 | 3 | 8 | 9 | 2 | 0 | 2 | 0 | 1 | 1 | 0 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | Low | .. | 2 | 0 | 0 | 1 | 1 | 18 | 6 | 4 | 2 | 13 | | 23 | 11 | 6 | 3 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | | *Over* | *10* | *10* | *9* | *8* | *7* | *6* | *5* | *4* | *3* | *2* | *1* | | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* | *13* | *14* | *15* | *16* | *17* | *18* | *19* | *20* | *21* | *22* |
| IV | Gifted | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 18 | 15 | 8 | 7 | 5 | 5 | 10 | 4 | 0 | 7 | 5 | 1 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| | Middle | .. | .. | 1 | 0 | 2 | 1 | 5 | 3 | 4 | 5 | 2 | | 65 | 28 | 29 | 9 | 6 | 5 | 11 | 3 | 0 | 1 | 2 | 1 | 3 | 0 | 1 | 0 | 0 | 1 | .. | .. | .. | .. | .. | .. |
| | Low | 1* | 2 | 5 | 0 | 2 | 0 | 15 | 5 | 3 | 1 | 11 | | 25 | 9 | 9 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | | *Over* | *10* | *10* | *9* | *8* | *7* | *6* | *5* | *4* | *3* | *2* | *1* | | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* | *13* | *14* | *15* | *16* | *17* | *18* | *19* | *20* | *21* | *22* |
| V | Gifted | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 25 | 12 | 15 | 2 | 1 | 8 | 11 | 5 | 1 | 4 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | .. | .. | |
| | Middle | .. | .. | .. | .. | .. | .. | .. | .. | 6 | 4 | 2 | 1 | 4 | 79 | 34 | 25 | 7 | 5 | 4 | 9 | 0 | 2 | 1 | 1 | 0 | 2 | 0 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. |
| | Low | .. | 1 | 0 | 0 | 2 | 2 | 13 | 7 | 6 | 3 | 4 | | 30 | 11 | 7 | 4 | 0 | 0 | 0 | 1 | 0 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | | *Over* | *10* | *10* | *9* | *8* | *7* | *6* | *5* | *4* | *3* | *2* | *1* | | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* | *13* | *14* | *15* | *16* | *17* | *18* | *19* | *20* | *21* | *22* |
| VI | Gifted | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 21 | 15 | 12 | 8 | 5 | 3 | 6 | 8 | 1 | 4 | 3 | 2 | 0 | 0 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. |
| | Middle | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 4 | 4 | 6 | 10 | 68 | 30 | 30 | 9 | 4 | 7 | 5 | 0 | 2 | 1 | 1 | 1 | 2 | 0 | 0 | 1 | .. | .. | .. | .. | .. | .. | .. |
| | Low | 1 | 0 | 0 | 1 | 0 | 1 | 9 | 9 | 7 | 7 | 12 | | 21 | 15 | 5 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |

*One pupil in Table IV is 18 months retarded.

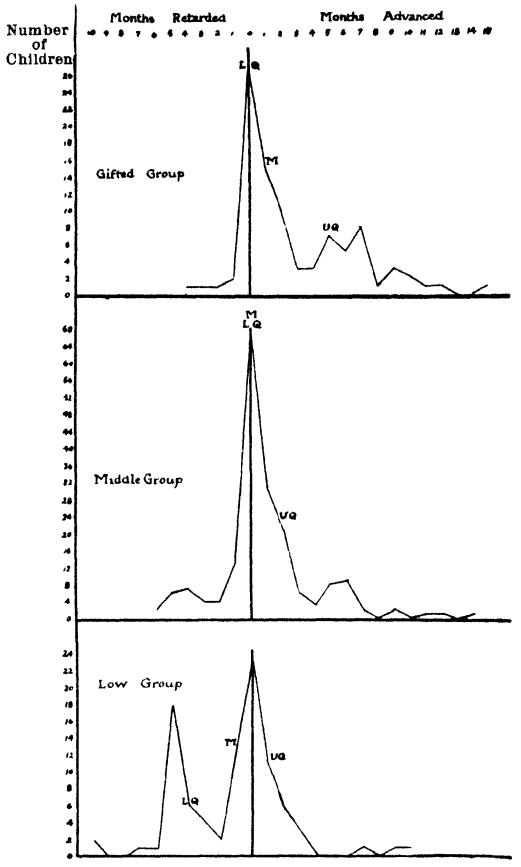



FIGURE II. PROGRESS IN ARITHMETIC

This gives distribution curves of the "gifted", "middle" and "low" groups in arithmetic. The *scale* for the "middle" group is just half that for the "gifted" and "low" groups since the "middle" contains twice as many children as either of the others. Read the chart as follows: The most rapid progress made in arithmetic in the "gifted" group was made by one child who was 1 yr. 6 mos. (15 mos.) advanced at the end of two years of individual work. No children were advanced 1 yr. 5 mos. (14 mos.); no children were advanced 1 yr. 4 mos. (13 mos.); one child was advanced 1 yr. 3 mos.; (12 mos.); one child was advanced 1 yr. 2 mos.; (11 mos.) and two children were advanced 1 yr. 1 mo. (10 mos.), etc. The fact that the mode falls at normal in all three groups is probably due to the tendency of children, teachers, and parents to think in terms of a grade a year and to make special effort to have a grade's work completed in each subject as the school year draws to a close.

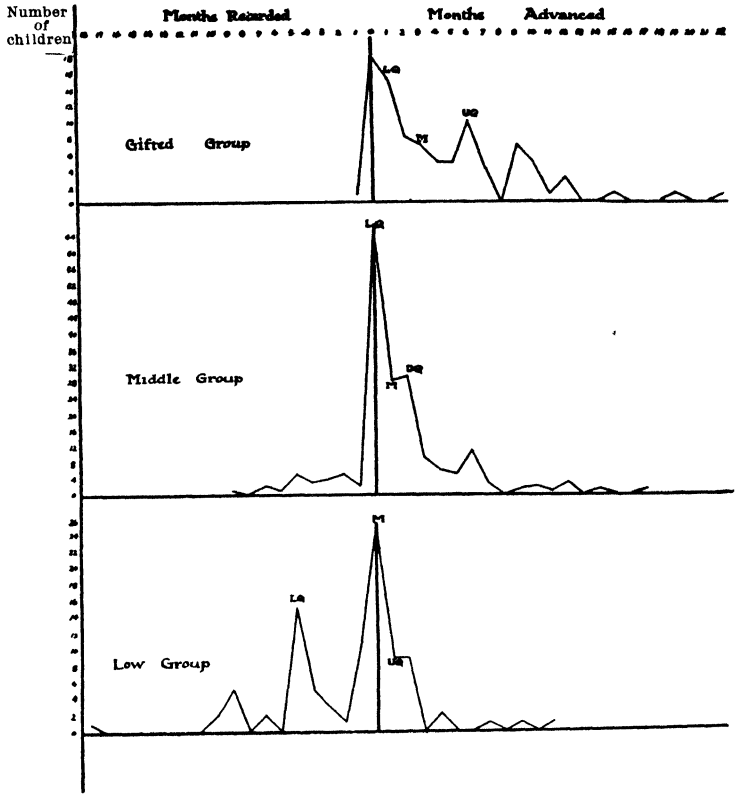



FIGURE III. PROGRESS IN READING

This gives the distribution curves of the "gifted," "middle" and "low" groups in reading progress. Read the chart according to directions given for Figure II.

test individually. This gave them the same classification as the National test and showed that the overlap of distribution must be due to some other cause.

The obvious assumption is that, while, other things being equal, progress may be proportionate to intelligence, and while for all the children the correlation between progress and intelligence quotients is reasonably high ($r = 0.587$), other factors, such as interest, ambition, health, home environment, etc., exercise a decided influence in the case of many individuals.

In contrast to the fairly high correlation between I.Q. and progress in general there is no correlation between them in the "gifted group" taken by itself ($r = 0.068$) or in the middle group taken by itself ($r = 0.08$). A wide variation in I.Q. evidently influences school progress decidedly; but when the range of I.Q. is only between 123 and 166, as with the "gifted group," or between 100 and 122, as with the "middle group," the I.Q.

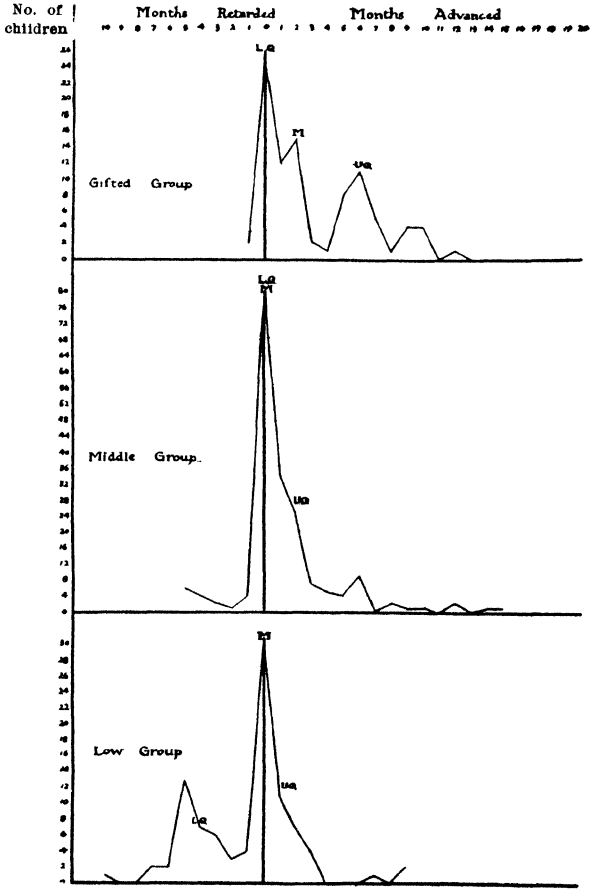



FIGURE IV. PROGRESS IN LANGUAGE

**The distribution curves for the "gifted," "middle" and "low" groups are shown in this figure, taking the children's progress in language. Read this chart according to directions given for Figures II and III.**

factor becomes almost negligible or is at least completely submerged by other, as yet unmeasured, factors.

In the case of the "low group," the numerical range is no greater than in that of the "gifted group" (40 points). The actual difference between two children with I.Q.'s of 60 and 100, however, is very much greater than the difference between two children with I.Q.'s of 123 and 166, respectively. This shows

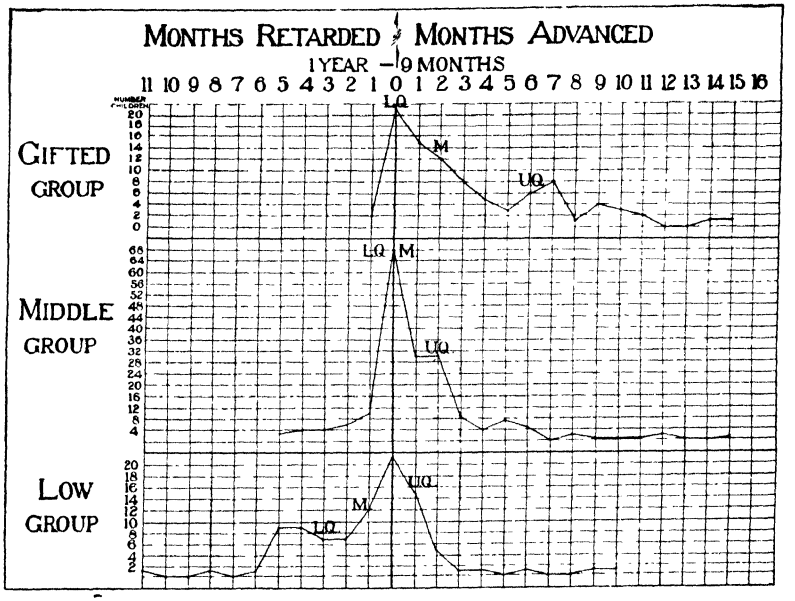



FIGURE V. PROGRESS TAKING AN AVERAGE OF READING, ARITHMETIC, LANGUAGE, WRITING, SPELLING AND HISTORY-GEOGRAPHY

This figure shows the distribution curves of the three groups in terms of average progress in the six individualized subjects. Read this chart according to the directions given for Figures II, III and IV. It should be remembered that the children themselves are not grouped—only their records have been grouped according to the children's intelligence quotients, for the purpose of this study.

clearly in the correlation between progress and intelligence quotient in the "low group," where $r = 0.407$, a definite and significant correlation.

Taking the results as a whole, one finds that the Winnetka technique apparently does make provision for individual differ-

ence in I.Q. where these differences are great. Where the differences in I.Q. are small, however, the differences in children's progress must be accounted for by other variables in the child's nature or in the school work and environment. These other factors have not yet been objectively determined.

That the traditional system is not making such provision for individual differences is obvious on the face of it. The fact that all children are given the same assignment with the same length of time to complete it, and that promotions are made annually or semi-annually, makes it impossible to adjust the amount of practice and amount of time to the individual children to anything like the same extent as is done in Winnetka. The records show that the Winnetka children in any one class are at many different points of progress, while in the traditional school the degree of mastery varies from child to child, yet all are necessarily at the same point.

Whatever the causes of children's differences, the wide distribution of their progress would indicate that there is real adaptation by the schools to these differences. The progress curves are all roughly normal, though skewed to the left and right in the cases of the "gifted" and "low groups," in harmony with expectation.

One peculiarity of these curves, however, should be noted. They all have more than one mode. The primary mode in all the subjects is always exactly at normal progress *for all three groups of children.* The secondary mode in every instance appears to the right for the "gifted" and "middle groups," to the left for the "low group." There is no corresponding bi-modality in the distribution of intelligence scores; this is a rather striking difference. We interpret this as reflecting a hold-over of the traditional system, which operates in the following ways:

Children in the "gifted" and "middle groups" who find themselves ahead of standard progress tend to relax effort. Parents and teachers alike feel complacent so long as the child progresses at the rate of one grade each year. Consequently, a considerable number of children fail to make use of the opportunity and ability to progress more rapidly, and are content to complete a grade

a year. The secondary mode perhaps shows what the typical progress of the group would be if all children were working approximately to capacity.

The children in the "low group," on the other hand, are probably still made to feel that progress of less than a grade a year is bad. Wherever possible, therefore, children, parents, and teachers unite in a special effort to get these slower ones across the line by June of each year. Some children simply can't make this degree of progress. These children spread out over a wide range; their mode falls to the left of the line of normal progress. This probably indicates that if there were not this urge to get children to finish one grade each year, the primary mode for this lowest quarter of the pupils would fall further to the left than it does and absorb the secondary one.

This interpretation of the distribution curves tallies with the personal observation of the superintendent.

The bi-modal tendency of the distribution, with the primary mode always at normal rate of progress, probably accounts, in considerable measure, for the lack of correlation between I.Q. and progress in the case of the two upper groups. It is conceivable that if the relic of the class system which still, even in Winnetka, makes people feel that a grade a year is the ideal progress of children through school, could be abolished, the correlation between progress and intelligence would be far higher.

## Conclusion

There still appears to be a tendency in Winnetka to regard a grade a year as the right amount of progress for every child. This tendency seemingly operates to push some of the slower children in the effort to get them to complete a grade's work each year, and likewise to slacken the efforts of some children of normal and superior intellect to progress as rapidly as they could.

Despite this tendency, the Winnetka schools succeed in making a large measure of adaptation to the individual differences as measured both by the spread among the rates of progress and by the correlation between progress and intelligence quotients.

# CHAPTER V

## MENTAL AGE AND INTELLIGENCE QUOTIENTS

What are the mental ages of the Winnetka children, grade by grade, and what are their intelligence quotients? How do these compare with those of the children in other schools?

As indicated in Chapter IV, the National Intelligence Test was given to all children in the Winnetka schools. It was also given to the children in another public school system in a suburb very similar to Winnetka (known in this report as School I),[1] to the children in a well known progressive, experimental, private school, (School II), and to the children in the laboratory school of a large university (School III).

The median National Intelligence scores of the children in the various grades in all four schools are shown in the accompanying table and figure. These data are summarized, and Winnetka compared with the average of all four schools in Figure VI. Table VII compares Winnetka to the average of these four schools and also to the grade norms published with the National Intelligence Test.

Since the achievement tests were not given in Grades 1, 2, and 8, and only the language test was given in Grade 7 (for reasons explained in the next chapter) no intelligence scores were obtained for the children of these grades.

[1] The children in Winnetka and in School I were divided into two groups, known as the "test group," and the "supplementary group." The "test group" consisted of one 3rd-grade room, one 4th-grade room, one 5th-grade room, and one 6th-grade room, tested by the research worker in the presence of an outside witness, as described more fully in Chapter VI. The "supplementary group" consisted of all other 3rd, 4th, 5th, and 6th grades in Winnetka and in School I. The Winnetka "test groups" are referred to as *WT* and the Winnetka "supplementary groups" as *WS* in the following tables and charts. The School I "test" and "supplementary" groups are referred to as *IT* and *IS*. In general, there are about four times as many children in the *WS* and *IS* groups as there are in the *WT* and *IT* groups. The number of children in Schools II and III correspond approximately to the number of children in the WT and IT groups.

The Winnetka children in Grade 7 were all tested by the research worker and, therefore, all formed a part of the "test group." No tests were given to the 7th grade of School I.

It is evident that all four schools have higher mental ages per grade than the schools where the National Intelligence Test was standardized; but that in Winnetka the mental age of the

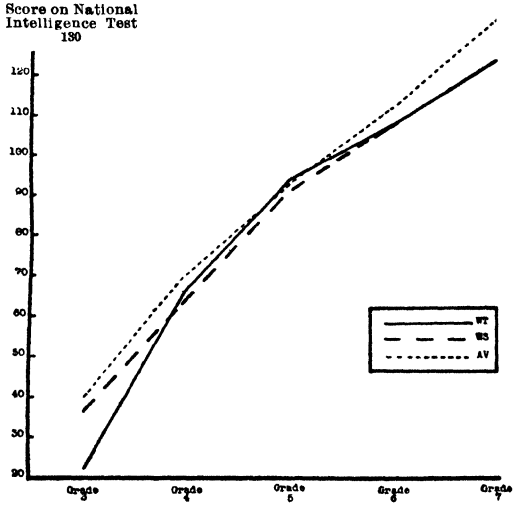



FIGURE VI. NATIONAL INTELLIGENCE SCORES

The point scores on the National Intelligence Tests for the Winnetka "test" and "supplementary" classes are compared in this figure with the average scores for the schools studied. These scores are taken grade by grade. Read the graph as follows: The median National Intelligence score for the Winnetka "test" third grade was 22. The median score for the "supplementary" third grade was 35, and the average score for all third grades compared was 39.17. The median score for the Winnetka "test" fourth grade was 66. The median score for the "supplementary" fourth grade was 64, while the average score for all fourth grades was 69.83, etc.

TABLE VII.—MEDIAN NATIONAL INTELLIGENCE SCORES OF WINNETKA, THREE COMPARISON SCHOOLS, AND GRADE NORMS

| Grade | N. I. T. | WT | WS | IT | IS | II | III | Average |
|---|---|---|---|---|---|---|---|---|
| 3 | 26 | 22 | 35 | 48 | 39 | 41 | 50 | 39.17 |
| 4 | 58 | 66 | 64 | 65 | 76 | 66 | 82 | 69.83 |
| 5 | 79 | 94 | 91 | 90 | 90 | 95 | 99 | 93.17 |
| 6 | 96 | 108 | 108 | 115 | 105 | 114 | 120 | 111.67 |
| 7 | 111 | 124 | ..... | ..... | ..... | 129 | 148 | 133.67 |

children in each grade is lower than in the three other schools that were compared.

The study of intelligence quotients yields similar results. When one considers intelligence quotients, however, one is able to combine the children of all grades and ages and, therefore, to compare the Winnetka schools as a whole with each of the other schools as a whole, as well as grade by grade, and with the country at large.

We know that the average intelligence quotient of the country at large is, by definition, 100. Consequently, the median intelligence quotient of Winnetka children reveals at once whether or not these children are unusually bright or about average.

It should be borne in mind that the National Intelligence test was used. The I.Q. scores above 100 on this test tend to be a few points higher for the same children than are those of the Stanford Binet.

Table VIII and Figure VII compare the intelligence quotients of children in the four schools.

TABLE VIII.—INTELLIGENCE QUOTIENTS OF WINNETKA AND THREE COMPARISON SCHOOLS

| | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|
| Upper Quartile. .. ..... . . . | 119 | 120 | 121 | 118 | 120 | 127 |
| Median . ..... . . | 107 | 105 | 112 | 107 | 110 | 118 |
| Lower Quartile ... | 98 | 91 | 103 | 94 | 98 | 105 |

Table VIII shows that Winnetka children are lower in I.Q. than those of the other schools, the most marked contrast being with School III. It is also evident that Winnetka children are not a highly selected group; the median I.Q. of the main group (WS) is 105, the lower quartile, 91. This median is very little higher than the median of the thousands of children on whom the National test was standardized.

It is interesting to note that the upper quartile of Winnetka children represents about the same degree of intelligence as does that of all the other schools studied, except III, and even there

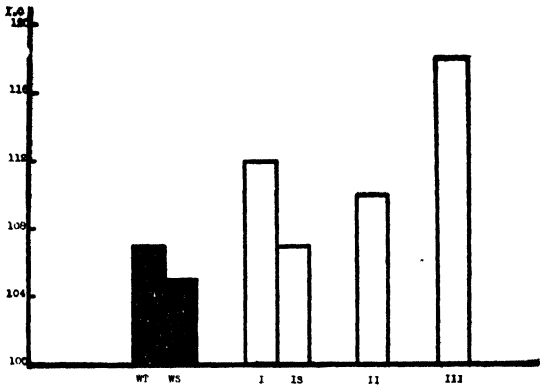



FIGURE VII. MEDIAN INTELLIGENCE QUOTIENTS

This graph compares the median Intelligence Quotients of the Winnetka "test" and "supplementary" classes with those of the rest of the children, school by school. These medians were taken of all the children that were tested from grades three to seven, school by school. Read the graph as follows: The median I.Q. of the children in the Winnetka "test" classes was 107. The median I.Q. of the children in the Winnetka "supplementary" classes was 105. The median I.Q. of the "test" group from School I was 112, while that of the "supplementary" group was 107, etc.

the difference is not great. Since medians are used throughout the following studies, however, these bright children will not affect the *grade* comparisons. In the mental age and progress comparisons they will be compared with their peers.

## SUMMARY

1. The Winnetka children in each grade are of somewhat lower mental age than the children of the other schools studied, while the children of School III are of decidedly higher mental age.

2. The intelligence quotients of the Winnetka children are slightly lower than those of any of the schools with which Winnetka is compared, especially lower than those of School III.

3. Winnetka's median general intelligence quotient is only a little above that of the general run of American schools. Winnetka's schools are not populated by 'selected' pupils.

# CHAPTER VI

## ACADEMIC ACHIEVEMENT IN ELEMENTARY SCHOOL SUBJECTS

Are those subjects which are being taught on an individual basis in Winnetka learned more effectively or less effectively than in schools using the class method?

To answer this question some 28,000 tests were given in the Winnetka schools and in the three comparison schools—a public school system of about the same size and social composition as Winnetka; a well known, progressive experimental private school; and a university laboratory school. The tests, which were given in September (or October) and again in February (or March) in order that progress could be measured, included the National Intelligence Test, which was given to all the children so that the standing of children according to their mental age might be determined, and the following achievement tests:

| Tests | Grades Used |
|---|---|
| Burgess Silent Reading | 3, 4, 5, 6 |
| Gray Oral Reading | 4 |
| Pressey Capitalization and Punctuation | 5, 6, 7 |
| Iowa Spelling Scale (20 words) | 3, 4, 5, 6 |
| Cleveland Survey Arithmetic | 3, 4, 5, 6 |
| Winnetka Arithmetic, as follows: | |
| Column Addition and Advanced Subtraction | 4, 5, 6 |
| Long Division and Compound Multiplication | 5, 6 |
| Addition, Subtraction, Multiplication, and Division of Fractions | 6 |

The data secured were used in three ways:

(1) Winnetka was compared, grade by grade, in each subject, with the other schools studied, and with published norms where these existed.

(2) Winnetka children of various *mental ages* were compared with children of the same mental ages in the different

schools, subject by subject, regardless of school grade, except that no tests were given to children in subjects they had not studied.

(3) The progress of Winnetka children from September (1923) to February (1924) was compared with that of the children in the other schools, in each subject test. For this study the pupils were grouped according to *starting point* in September. Thus, all pupils, regardless of grade or mental age, who in September could read 6 or 7 paragraphs on the Burgess scale were considered together, and their scores in February were compared with this starting point to determine their progress.

## Precautions in Administration

Before considering the results of these tests, subject by subject, the method of giving them should be described, and certain terms used in the later descriptions explained.

The research worker, Miss Vogel, gave all the tests in Schools II and III—the experimental private school and university laboratory school. She also gave all the tests in one class of each grade from 3 to 6 in comparison School I and in one class of each grade from 3 to 7 in Winnetka. A disinterested witness, Mrs. Homer Rainey, was present in all four schools and watched the timing and other details of the giving of these tests both in September and in February.

Since, however, there were several classes of each grade both in Winnetka and the other public school system (School I), and since it was impossible in the time at our disposal to have the research worker and witness work in more than one classroom of each grade in each system, arrangements were made to have the remaining classrooms tested, both in September and February, by three experienced teachers.[1] The classes in Winnetka and School I which were tested in this way represented a much larger number of children than did those tested by the research

[1] Sarah Grace Rabwin, University of Michigan; Frieda Barnett, University of Iowa, both teachers in the Winnetka Public Schools; and Carrie Husenetter of Nebraska Wesleyan College, who was at the time substituting in School I and other North Shore suburbs.

worker, but since the testing conditions were not as rigidly controlled, the two sets of children have been considered separately throughout this study. The children tested by the research worker and witness are referred to as the "test" groups, represented by *WT* for Winnetka, and by *IT* for the other public school system. The children tested by any one of the three other teachers are referred to as the "supplementary" groups, represented by *WS* for Winnetka and by *IS* for the other public school system. Results are, therefore, tabulated under six heads as follows:

WT WS IT IS II III

Since these symbols are used thruout this study, may I not reiterate their meaning? *WT* means the Winnetka "test" group; *WS*, the Winnetka "supplementary" group; *IT*, the "test" group of the other public school system; *IS*, the "supplementary" group of the other public school system; *II*, the experimental private school; and *III*, the university laboratory school.

### Handling of Scores for Purposes of Comparison

For the purpose of comparison a uniform method of evaluating and inter-relating the various tests soon became very desirable. The uniform method ultimately adopted was to find norms for the groups of schools tested and to reduce all scores to a percentage of these norms.[2] These norms were found as follows:

[2] "B" scores were considered, but rejected, not only because there were no norms established for some of the tests, but also because some of the scores were above the highest, or below the lowest "B" score, where this existed. Published standard norms might have been used for some tests and our scores reduced to a percentage of these norms, but the Winnetka arithmetic tests have not been standardized, and the language standards are not established for all the grades in which the tests were given; so it was decided to take as a norm, an average of the median scores of the six groups tested in each subject, (by grades, and by mental age groups). In this way, grade and mental age norms, were established for the total groups of schools being studied, and each school's score on any given test in any given grade or mental age group could then be expressed as a percentage of the corresponding grade or mental age norm.

The median score (midscore) for a grade in any subject in February was found for each school for all children who were present for National Intelligence Tests and for both September and February tests. *WT, WS, IT,* and *IS* were counted as *four* schools, not two.[3] The average of these six medians (WT, WS, IT, IS, II, and III) constituted the norm for a given grade in that subject. For instance, the median scores on the Burgess Reading scale for the 4th grade in February were: WT, 9; WS, 9; IT, 8; IS, 9; II, 9; III, 10. The average of these medians is 9, so 9 is the norm for this grade. The Winnetka scores are 100% (*WT*) and 100% (*WS*) of this. School *IT* made a score of 89%; *IS,* 100%; *II,* 100%; and *III,* 111%.

Similarly, mental age norms were found by getting the average of the median scores for each mental age group. The six mental age groups were based on the following National Intelligence scores:

| Score | Mental Age |
|---|---|
| 40 – 54 | 8 and not yet 9 |
| 55 – 69 | 9 and not yet 10 |
| 70 – 84 | 10 and not yet 11 |
| 85 – 101 | 11 and not yet 12 |
| 102 – 116 | 12 and not yet 13 |
| 117 – 129 | 13 and not yet 14 |

To compare children's progress, it was necessary to compare those who started at approximately the same place. For this purpose the September test scores for all children were divided into four parts for each test—a bottom quarter (1 Q), a second quarter (2 Q), a third quarter (3 Q), and a top quarter (4 Q). Sometimes the spread in the top and bottom quarters was so great that children falling in one of these quarters were far from

[3] The general average or general median for all the pupils of a grade or an age was avoided because this method would have overweighted Winnetka and the other public school system so heavily as to make the results of the two other schools negligible. The median for each school was taken, rather than the average, to avoid the possibility of single individuals unduly modifying the results. The average of medians was taken as a norm, rather than a median of medians, because a median of a series of six would be comparatively meaningless and anyway would necessitate the averaging of the two middle members.

equal to each other. So it was arbitrarily decided not to consider either of these extreme quarters when the range of scores included in it was more than one and one-half times as great as the range within the adjacent middle quarter. The two middle quarters (2 Q and 3 Q) were always used.

Progress was measured for each quarter as follows:

The gains from September to February were found for each child in the quarter under consideration; a median of these gains was found for each school; the average of these median gains was considered as a norm, and the gain of each school was reduced to a percentage of that norm. In this way it was possible to get a fairly simple, common measure of progress for each quarter of the children and to compare the progress of one school with that of another or of all.

## Results in Reading

Winnetka has apparently been doing distinctly satisfactory work in reading. Whether one considers the children by grades or by mental age groups, the reading achievement is above the average of the schools studied.

The Burgess Picture Scale, form 4, was used to measure silent reading ability. Winnetka's scores have been compared with those of each of the other schools studied and with the published norms of the test, grade by grade (Table IX). Then the Winnetka results, re-grouped according to the mental ages of the children, have been compared with those of pupils of the same mental ages in the comparison schools (Table X). Finally, the progress of the Winnetka children from September 1923 to February 1924 has been compared with that of the comparison schools (Table XI).

The grade-by-grade comparison is shown in Table IX and summarized in Figure VIII. The Winnetka "test" third grade falls below the average of the other third grades; this is probably a direct reflection of unusually low average mental age of this particular group. (Compare the same sort of reflection of low mental age in the results of the fourth-grade "test" class of

School I.) Otherwise, in every grade Winnetka is up to or above the average of the group of schools with which it is compared. This is a particularly good showing, since in almost every grade the Winnetka mental age is below the average of the other schools.

TABLE IX.—BURGESS SILENT READING TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS BY GRADES
(February Scores Number Paragraphs Correct)

| Grade | Published Norm | Average of Schools Studied | Per cent Each School is of Average of Schools Studied | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | WT | WS | IT | IS | II | III |
| 3 | 5 | 7.1 | .85 | .99 | 1.13 | .85 | .99 | 1.20 |
| 4 | 7 | 9.0 | 1.00 | 1.00 | .89 | 1.00 | 1.00 | 1.11 |
| 5 | 8 | 10 9 | 1.10 | 1.05 | 1.01 | .92 | .83 | 1.10 |
| 6 | 9 | 12.8 | 1.02 | 1.09 | 1.02 | .94 | .86 | 1.09 |
| Average ..... | | | .99 | 1.03 | 1 01 | .93 | .92 | 1.13 |

The striking superiority of School III is noteworthy. This school, it is true, has the highest mental age in each grade and the highest I.Q. of the schools studied; but its superiority in reading is not entirely accounted for by that fact, as will be seen in Table X.

Comparing Winnetka with standard norms we find a still more striking superiority. The scores of the "test" classes were, on an average, 136% and those of the "supplementary" groups 142% of the established norms. Indeed, all the schools studied went far above published norms in silent reading. Contrast this excellent showing in reading with the way all the schools studied dropped below the Grand Rapids norms in arithmetic.

It is interesting to note that all the schools studied do their reading on a partly individualized basis. School III and Winnetka, which made the highest reading records, adapt their reading work more closely than do the other schools to the children's individual needs, since the children read books that fit their reading ability and read large numbers of them (at least 15 a year in Winnetka). It is hard to avoid the conclusion that individual

work in reading is at least partly responsible for the exceedingly good records.

The fairest comparison of schools is, however, by mental age groups rather than by grade groups. Is Winnetka doing as much for children of a given mental age as are the other schools? Table X and Figure VIII answer this question.

TABLE X.—BURGESS SILENT READING TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS BY MENTAL AGES

(February Scores, Paragraphs Correct)

| Mental Age | Average of Schools Studied | Per cent Each School is of Average of Schools Studied | | | | | |
|---|---|---|---|---|---|---|---|
| | | WT | WS | IT | IS | II | III |
| 8- 9. . . . . | 7 6 | .. | 1.05 | .92 | .92 | 92 | 1.18 |
| 9-10.. . . . . | 8 3 | .96 | 1 08 | 96 | .96 | 96 | 1 08 |
| 10-11... .. . | 9 8 | 1.08 | 1 02 | .92 | .92 | 92 | 1.13 |
| 11-12. . | 11.2 | 1.08 | .98 | 1 08 | .98 | 89 | .98 |
| 12-13... .. . | 12.9 | .. | 1.01 | 1 05 | 1 01 | .89 | 1 05 |
| Average . . . . | | 1 04 | 1 03 | 99 | .96 | 92 | 1 08 |

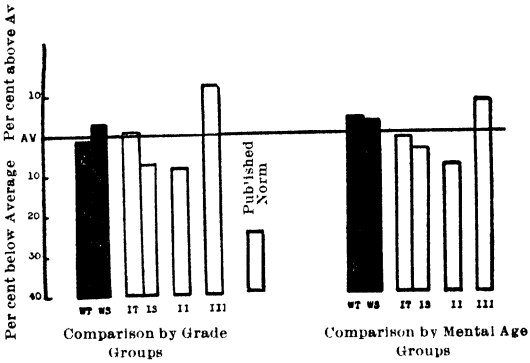



FIGURE VIII. BURGESS SILENT READING TEST

This figure shows a comparison of the four schools grade by grade and mental age by mental age in the Burgess Silent Reading test. Read the chart as follows: The Winnetka "test" classes (averaged grade by grade) made scores which were 1% below the average for all the schools studied. The scores of the "supplementary" grade groups were 3% above the average, those of the "test" classes of School I were 1% above the average, while those of the "supplementary" classes in School I were 7% below the average. The published norms for the test were 26% below the average scores of the schools studied. The second part of this graph compares the scores of the schools studied, grouping children by mental age instead of by grades. This part of the graph is read in the same way as the first part.

In every group Winnetka "test" or "supplementary" classes are above the average. In the 9-10 group (*i.e.* children mentally 9 years old but not yet 10) the "test" class fell a little below; in the 11-12 group the "supplementary" group dropped to 98% of the average. The full comparison is shown best in the summary graph, Figure VIII, which averages the standings of the five mental age groups. This part of the figure shows the same ranking of the schools as did the first part, which compared them by grades.

The discrepancy between the test and supplementary groups both in Winnetka and School I, however, is reduced to an almost negligible quantity. School III drops from 113% of the average to 108% while the Winnetka "test" group rises from 99% to 104%. The superiority of School III, while not so marked, is still evident. This superiority, thus seen to be independent of mental age, is probably due to the unusually strong emphasis that is known to have been placed upon reading in that particular school.

Comparisons in terms of progress are rather general since the measure of progress is large, and the maximum difference between schools is only one unit (*i.e.*, one paragraph). There is no way of dividing this unit. The results are shown in Table XI.

TABLE XI.—BURGESS SILENT READING TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS IN TERMS OF PROGRESS FROM SEPTEMBER TO FEBRUARY

| Score at Starting Point | | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 6 to 7 | No of Children ... | 25 | 75 | 30 | 90 | 18 | 22 |
| | Median Gain . . | 2 | 2 | 2 5 | 2 | 2 5 | 3 |
| 8 to 10 | No of Children .... | 23 | 98 | 47 | 95 | 25 | 27 |
| | Median Gain . | 3 | 2 | 3 | 2 | 2 | 3 |

The children in the Winnetka "test" and "supplementary" groups starting at 6 or 7 paragraphs in September made a gain of two paragraphs in one semester (the standard gain is only one

paragraph a year). The children in the *IS* group made the same median gain. Those in School III gained three paragraphs, maintaining the high record made in the other reading comparisons. The median in Schools I and II fell between a two-paragraph and a three-paragraph gain.[4]

The comparison of progress of children starting with a score of eight, nine, or ten paragraphs, shows the same sort of gains. The Winnetka "test" group, School I, and School III gained three paragraphs, the other schools, two. These gains are high; the difference between them is relatively insignificant. There was so wide a range of beginning scores that the groups compared (except *WS* and *IS*) range for the most part between 18 and 27 children. The main significance of this phase of the study is that Winnetka, as well as the other schools studied, made excellent progress in silent reading between September and February.

Oral reading was tested by the Gray Oral Reading test, but in the fourth grade only. Consequently, there were not enough children in any one mental age group to make mental age comparisons possible. Neither were there enough children starting at any one point in September to make progress comparisons possible. We are confined simply to a comparison of Winnetka fourth-grade pupils with those of the other schools and with the published norms.[5] Table XII and Figure IX present this comparison.

It is evident from Table XII that Winnetka is doing reasonably satisfactory work in oral reading. The "test" group falls somewhat below the average of the other schools, but the "supplementary" group, representing four times as many children, is 3 percent above this average. But the Winnetka "test" group had a mental age over one-fourth year lower than the average

[4] These large gains may, of course, be partly due to practice effects resulting from the test having been given 5 months previously. The inter-school comparisons, however, are valid.

[5] The Gray Oral Reading tests were scored on the basis of 25 points for the first paragraph; Gray's directions with 4th-grade standards were used throughout.

of the schools studied. The only group that made a score higher than the Winnetka "supplementary" fourth grades was School III, which had a median mental age in its fourth grade of almost eleven years, as compared with the Winnetka "supplementary"

TABLE XII.—GRAY ORAL READING TEST. COMPARISON OF THE WINNETKA FOURTH GRADE WITH OTHER SCHOOLS

(February Scores in Points)

| Published Norm | Average of Schools Studied | Per cent Each School is of Average of the Schools Studied | | | | | |
|---|---|---|---|---|---|---|---|
| | | WT | WS | IT | IS | II | III |
| 46.5 | 48.75 | .93 | 1.03 | .97 | . . . . . | .97 | 1 10 |
| SCORES IN NATIONAL INTELLIGENCE TESTS. | | | | | | | |
| 63.0 | 68.4 | .91 | .96 | .94 | ..... | .99 | 1.20 |

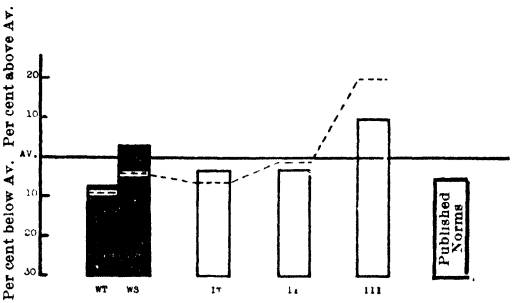



FIGURE IX. GRAY ORAL READING TEST

In this figure the median scores of the fourth grade children on the Gray Reading Test in the four schools are compared with an average score for all the schools studied. The published norm is also compared with this average. In this same figure a heavy dotted line has been drawn to indicate the per cent that each group's median mental age is of the average mental age for all schools studied. Read the graph as follows: The children of the Winnetka "test" class had a reading score which was 7% below the average score of the schools studied. The mental age of this same group was 9% below the average mental age of all schools studied. The score of the Winnetka "supplementary" group was 3% above the average, while the mental age of this same group was 4% below the average mental age of all schools studied.

fourth grades where the median mental age was less than ten years.

The per cent that the mental test scores of each school are of the average is set down for comparison with the per cent each

school's achievement in oral reading is of the average. If mental test scores be taken into account, Winnetka (test and supplementary) and School I made the best records, while School III made the poorest record.

The average of the schools studied (48.75 points) was somewhat above the published test norm in oral reading (46.5 points). The score of the Winnetka "test" group was 97 percent, that of the "supplementary" group 108 percent of this norm.

In summary, all the schools studied went far beyond the published norms in silent reading. Winnetka, in both grade and mental age comparisons, excelled the average of the schools studied. In progress from September to February every school progressed either two or three paragraphs on the Burgess scale.

In oral reading, when the mental ages of the groups were considered, Winnetka made a decidedly good record. Even without this consideration, the record was satisfactory.

## Spelling

Spelling achievement was measured in two ways—general spelling ability, as indicated by scores on words not studied, and specific spelling ability, as indicated by scores on words that had been studied. The spelling curriculum of the four schools under comparison differed so widely that it was difficult to find any list of words that had been studied in all four places by pupils in the same grade. This part of the spelling investigation was, therefore, completed later than the other parts (December, 1924).

The comparison of ability to spell words not studied was made as follows:

In September twenty words selected from the Iowa Spelling Scale at the level of 70 per cent for each grade were dictated. This level means that the median February score for large numbers of children would normally be 70 per cent on such a list. The same words, together with others at the same level, were given again in February. Any words studied between September and February were then eliminated from the record of the groups

that studied them, and, as far as possible, any words which had been previously studied were also eliminated.

In this comparison Winnetka drops to the bottom of the schools studied, both in grade and mental age groups. Only one grade and only two mental age groups reached a score as high as the average of the other schools studied. See Tables XIII and XIV for details.

TABLE XIII.—SPELLING TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS BY GRADES
(February Scores for Words Not Studied)

| Grade | Published Norm | Average of School Studies | Per cent Each School is of Average of Schools Studied | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | WT | WS | IT | IS | II | III |
| 3 | 70 | 80.83 | 87 | .87 | 1.11 | .99 | 1.11 | 1 05 |
| 4 | 70 | 69 17 | 1.01 | .87 | .94 | 1.08 | 1.08 | 1.01 |
| 5 | 70 | 62 83 | .80 | .95 | 1 35 | 1 15 | .80 | .95 |
| 6 | 70 | 69 17 | .87 | .87 | 1.16 | 1.01 | .94 | 1.16 |
| | Average | | .89 | 89 | 1 14 | 1.06 | .98 | 1.04 |

TABLE XIV.—SPELLING TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS BY MENTAL AGES
(February Scores for Words Not Studied)

| Mental Age | Average of Schools Studied | Per cent Each School is of Average of Schools Studied | | | | | |
|---|---|---|---|---|---|---|---|
| | | WT | WS | IT | IS | II | III |
| 8- 9. .. . .. | 66.50 | ... | 1 13 | .98 | .94 | .68 | 1.28 |
| 9-10 . . . . | 72 08 | .76 | .83 | 1 01 | 1.08 | 1.25 | 1.07 |
| 10-11 . .. .. | 62.00 | 1.13 | .81 | 1.21 | 1.08 | 65 | 1.13 |
| 11-12 .. | 67.75 | .89 | .77 | 1.26 | 1.06 | .81 | 1.21 |
| 12-13 .. | 74 17 | .88 | .94 | 1.15 | 1 04 | 1.05 | .94 |
| 13-14 . ... | 83.75 | | .95 | 1.02 | 1.08 | | .95 |
| Average | | .92 | .91 | 1 11 | 1.05 | .89 | 1.10 |

A study of the progress from September to February, on the other hand, shows Winnetka making better progress than the average of the schools studied, as only one school (III) equals or excels the Winnetka record. That school uses a method of teaching spelling which is largely individualized. Its method is one

which is compared under test conditions with the Winnetka method in Chapter VIII. The median I.Q. of this School III is 118 while that of Winnetka is 107 and 105 for the "test" and "supplementary" groups, respectively. The graph, Figure X,

TABLE XV.—SPELLING TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS IN TERMS OF PROGRESS FROM SEPTEMBER TO FEBRUARY

| Group | Score at Starting Point | Average Progress of Schools Studied | Per cent Each School is of Average of Schools Studied | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | WT | WS | IT | IS | II | III |
| 1 Q | 0 to 25% | 20.83% | .96 | .96 | .72 | 1.20 | .96 | 1.20 |
| 2 Q | 30 to 50% | 17.50% | 1.00 | 1.14 | 1.14 | .86 | .57 | 1 29 |
| 3 Q | 55 to 75% | 14 58% | 1.03 | 1.03 | .85 | 1 03 | 1.03 | 1.03 |
| Average* . . | | . . . | 1 00 | 1.04 | 90 | 1 03 | .86 | 1 17 |

*The 4 Q group is not included because the number of 100% children who in the nature of things could make no progress between September and February throw out the averages The 4 Q progress was as follows:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 Q | 80 to 100% | 2.50% | 0.00 | 2.00 | 0.00 | 0.00 | 2.00 | 2 00 |

compares Winnetka with each of the other schools and with the average of all the schools studied, by grades, by mental ages, and by progress during one semester, in ability to spell words not studied.

This graph and the whole study present a puzzling picture. If the Winnetka method of teaching spelling is less efficient than that used in the other schools, as both the grade comparisons and mental age comparisons would indicate, why did the Winnetka children improve more rapidly than children *of the same spelling ability* in the other schools? For it will be understood that in this study of comparative progress children whose September scores fell within a certain range in one school are compared with children in the other schools whose September spelling scores fell within the same range.

One possible explanation is that the Winnetka technique of teaching spelling was relatively ineffective in its carry-over to words not studied until about the time of the investigation and

that the method was improved just before or during the period of the study in such a way as to increase the carry-over effect.

As a matter of fact, a change of method did occur in the spring of 1923. Up to that time there had been almost no training in the technique of how to study words. Children simply studied lists of words which they had misspelled in pre-tests. They studied them in any way they saw fit without any special directions. In the spring of 1923, however, a definite method of word study was introduced. Under this method each child still had

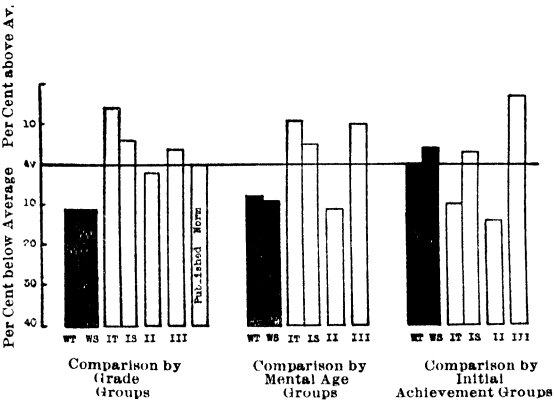



FIGURE X. SPELLING NOT STUDIED

This figure compares Winnetka with each of the other schools and with the average of all the schools studied, by grades, by mental ages, and by progress of initial achievement groups during one semester, in ability to spell words not studied. Read the graph as follows: The spelling score of the Winnetka test classes (averaged by grade groups) was 11% below the average score made by all groups. The score of the Winnetka supplementary group was also 11% below the average score for all schools. The second part of the graph, which compares the children by mental age groups is read in the same way. The third part shows relative progress from September to February, the children being grouped according to September achievement tests. The Winnetka "test" group made exactly average progress, the "supplementary" group, progress 4% above average, etc.

his individual list of misspelled words to study, but the children as a group were given careful training in the method of study.

It is conceivable that this may explain the discrepancy between the actual spelling abilities of the different schools and the progress made between September and February. If the

Winnetka method prior to 1923 was not effective in carrying over to words not studied, the average standing of the children in February, 1924, would naturally be below that of the other schools. On the other hand, if the method introduced in 1923 was effective in bringing about an improvement of general spelling ability, one would expect the Winnetka Schools to show a decided gain and to begin to overtake the other schools studied. Table XV and Figure X appear to bear out this hypothesis.

In ability to spell words not previously studied, then, the Winnetka schools fell distinctly below the others, both by grade groups and by mental age groups. In progress from September to February in the spelling of such words without study, the Winnetka children excelled the average of the other schools.

The second part of the study of spelling, shows a much evener distribution of abilities, but Winnetka still ranks somewhat below the schools with which it was compared, even though it ranks above the published norm.

The method used in this part of the study was as follows:

The research worker went over the lists of words studied in each school. She then made lists of the words common to all schools for each particular grade. Since School II has no regular course of study in spelling, it was impossible to know what words had been studied. It was assumed that words which were common to the three other schools probably had been studied in School II.

The list of words for a particular grade was checked with the Iowa Spelling Scale for that grade. The level at which each word occurred was noted. Twenty of those occurring at the lowest level were chosen.[6] In no grade were these twenty words at any one level. An average level, therefore, had to be figured. This average level has been considered the norm in this study.

A median score was then found for each group and each mental age group. Each school's score in any given grade or mental

[6] In the third grade, there were only sixteen words which had been studied by the children in all the schools. These ranged from 73% to 93% on the third-grade list of the Iowa Spelling Scale.

age group was reduced to a percentage of the corresponding grade or mental age norm.[7]

The results are shown in Tables XVI and XVII and Figure XI.[8]

TABLE XVI.—SPELLING TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS BY GRADES

(December, 1924, Scores for Words Studied)

| Grade | Average Norm | Average of Schools Studied | Per cent Each School is of Average of Schools Studied | | | |
|---|---|---|---|---|---|---|
| | | | W | I | II | III |
| 3 | .87 | 92 5 | 95 | 1 02 | 1 08 | .95 |
| 4 | .92 | 95 | 1.00 | 1.00 | 1 00 | 1 00 |
| 5 | 87 | 92 5 | 97 | 1.03 | .97 | 1 03 |
| 6 | 85 | 91 25 | 99 | .99 | .99 | 1.04 |
| Average . . . | | | 98 | 1 01 | 1 01 | 1 01 |

TABLE XVII.—SPELLING TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS BY MENTAL AGES

(December, 1924, Scores for Words Studied)

| Mental Age | Average of Schools Studied | Per cent Each School is of Average of Schools Studied | | | |
|---|---|---|---|---|---|
| | | W | I | II | III |
| 8- 9 . . | 90 75 | 99 | .99 | 1 05 | .97 |
| 9-10 . | 91 | 98 | 99 | 1 07 | .97 |
| 10-11. . | 91 25 | .99 | 1.04 | .93 | 1.04 |
| 11-12 . . | 92 5 | .97 | 1 03 | 1 03 | 97 |
| 12-13 . | 93 75 | .96 | 1.01 | 1.01 | 1 01 |
| 13-14. . . .. | 94 5 | .98 | 1 01 | 1.01 | 1 01 |
| Average . . | | .98 | 1.01 | 1.02 | 1.00 |

The differences among the schools are smaller here than in any other subject. The extreme range of average scores is only 3 percent by grade averages, 4 percent by mental age averages. The median scores made by every grade and mental age group are almost entirely in the 90's. This means that there are many

[7] In this part of the study, no distinction has been made between the "Test" and "Supplementary" classes. This was because all words were dictated by the teachers; no children were tested by the research worker.

[8] In words studied no study of progress could be made as none of the words had been dictated previous to December, 1924.

perfect scores, which prevents accurate comparison. The reason for these high scores lies in the fact that it was only the easier, more common words that had been uniformly included in all four curricula.

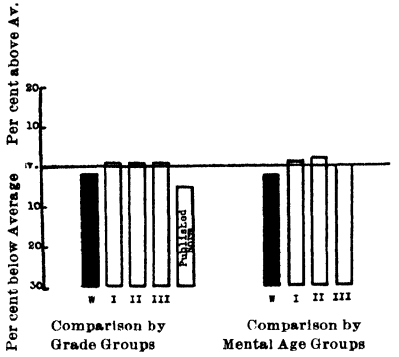



FIGURE XI. SPELLING. (WORDS STUDIED)

This figure compares the scores of each of the four schools with the average of all. The comparison is given by grade groups and by mental age groups. Read the chart as follows: In words which the children had studied the Winnetka children had a score which was 2% below the average of all schools studied. The children of schools I, II, and III had scores which were 1% above the average for all schools studied. In this graph there are no "test" and "supplementary" groups. The children have been lumped and only one score taken for Winnetka and for School I.

The differences in the scores are too small to be significant. All four schools are doing approximately the same quality of work in spelling as far as this part of the study goes.

School III uses a method almost as individual as that used in Winnetka. School II has no regular method; the pupils for the most part study only those words missed in their compositions. School I uses the class method. Apparently, the easier, common words are learned about equally well under any method.

Were the matter of the efficiency of the individual method of teaching spelling to rest on these studies alone, it would be open to question. In absolute ability to spell words not studied Winnetka children were distinctly inferior. In rate of improvement in ability to spell words not studied Winnetka was somewhat superior. In ability to spell simple, common words which had been studied, Winnetka was very slightly inferior again

Fortunately, we have in Chapter VIII a more satisfactory comparison under better controlled conditions. It is reasonable to suppose that having children concentrate upon the words they do not know would be much more efficient than having all children of all abilities study the same words. The present comparison of schools, however, would indicate that Winnetka had not, up to September, 1923, at least, succeeded in establishing this technique effectively enough to demonstrate any such superiority as the theory would lead one to expect.

## LANGUAGE

Formal language was measured by the Pressey punctuation and capitalization tests (scored by number of sentences correct). The Winnetka children were far beyond those of the other schools and still farther beyond the published norms where such norms existed.

Tables XVIII, XIX, XX, XXI, XXII, and XXIII compare the per cents of average norms for these tests by grades, by men-

TABLE XVIII.—PRESSEY CAPITALIZATION TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS BY GRADES
(February Scores, Number Sentences Correct)

| Grade | Published Norm | Average of Schools Studied | Per cent Each School is of Average of Schools Studied | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | WT | WS | IT | IS | II | III |
| 5 | ... ... | 15.2 | 1.05 | 1.18 | .92 | .99 | .88 | .99 |
| 6 | 15 | 19.1 | .99 | 1.05 | .94 | .83 | 1.05 | 1.15 |
| 7 | 17 | 22.0 | 1.00 | .. ... | .... . | . .. | .95 | 1.05 |
| Average . ... . . | | | 1.01 | 1.12 | .93 | .91 | .96 | 1 06 |

TABLE XIX.—PRESSEY PUNCTUATION TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS BY GRADES
(February Scores, Number Sentences Correct)

| Grade | Published Norm | Average of Schools Studied | Per cent Each School is of Average of Schools Studied | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | WT | WS | IT | IS | II | III |
| 5 | ..... ... | 7.3 | 1.09 | 1.36 | .96 | .82 | .68 | 1.09 |
| 6 | ..... ... | 9.4 | 1.06 | 1.38 | .74 | .64 | .96 | 1.22 |
| 7 | 10 | 15.0 | 1.00 | ..... | ..... | ..... | .80 | 1.20 |
| Average..... | | | 1.05 | 1.37 | .85 | .73 | .81 | 1.17 |

TABLE XX.—PRESSEY CAPITALIZATION TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS BY MENTAL AGES
(February Scores, Number Sentences Correct)

| Mental Age | Average of Schools Studied | Per cent Each School is of Average of Schools Studied | | | | | |
|---|---|---|---|---|---|---|---|
| | | WT | WS | IT | IS | II | III |
| 11–12..... | 16.1 | 1.12 | 1.15 | 1.03 | .93 | .87 | .90 |
| 12–13..... | 19.2 | 1.04 | 1.02 | .94 | .94 | .96 | 1.10 |
| 13–14..... ..... | 19.9 | 1.03 | 1.05 | .90 | .90 | 1.00 | 1.11 |
| Average ... ... . | | 1.06 | 1.07 | .96 | .92 | .94 | 1.04 |

TABLE XXI.—PRESSEY PUNCTUATION TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS BY MENTAL AGES
(February Scores, Number Sentences Correct)

| Mental Age | Average of Schools Studied | Per cent Each School is of Average of Schools Studied | | | | | |
|---|---|---|---|---|---|---|---|
| | | WT | WS | IT | IS | II | III |
| 11–12 ..... .. | 7.6 | 1.19 | 1.32 | .79 | .79 | .92 | .99 |
| 12–13..... ... | 9.7 | 1.34 | 1.14 | .72 | .83 | .93 | 1 03 |
| 13–14..... . | 11.1 | 1.17 | 1.26 | .81 | .86 | .90 | .99 |
| Average. .. . . . | | 1.23 | 1.24 | .77 | .83 | .92 | 1.00 |

TABLE XXII.—PRESSEY CAPITALIZATION TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS IN TERMS OF PROGRESS FROM SEPTEMBER TO FEBRUARY

| Group | Score at Starting Point | Average Progress | Per cent Each School is of Average of Schools Studied | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | WT | WS | IT | IS | II | III |
| 2 Q | 11–14 | 4.20 | .95 | 1.19 | .95 | .71 | .... . | 1.19 |
| 3 Q | 15–18 | 3.42 | 1.17 | .88 | .88 | .88 | .88 | 1.32 |
| Average . . . . . | | | 1.06 | 1.04 | .92 | .80 | .88 | 1.26 |

TABLE XXIII.—PRESSEY PUNCTUATION TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS IN TERMS OF PROGRESS FROM SEPTEMBER TO FEBRUARY

| Group | Score at Starting Point | Average Progress | Per cent Each School is of Average of Schools Studied | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | WT | WS | IT | IS | II | III |
| 2 Q | 5– 7 | 1.42 | .70 | 2.48 | .70 | .00 | .70 | 1.41 |
| 3 Q | 8–11 | 1.90 | 1.05 | 1.58 | ..... | .27 | 1.05 | 1.05 |
| Average . .. . .... | | | .88 | 2.03 | .70 | .14 | .88 | 1.23 |

tal age groups, and progress achieved by different groups. Table XXIV and Figure XII compare the scores of the Winnetka schools with the average of all the school studied, with each

TABLE XXIV.—AVERAGES FOR CAPITALIZATION AND PUNCTUATION TESTS COMBINED. COMPARISON OF WINNETKA WITH OTHER SCHOOLS

(In terms of per cent that each school is of the average of schools studied; February scores)

| | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|
| By Grades | 1.03 | 1.25 | .89 | .82 | .89 | 1.12 |
| By Mental Ages | 1.15 | 1.16 | .87 | .88 | .93 | 1.02 |
| By Progress Groups | .97 | 1.54 | .81 | .47 | .88 | 1.25 |

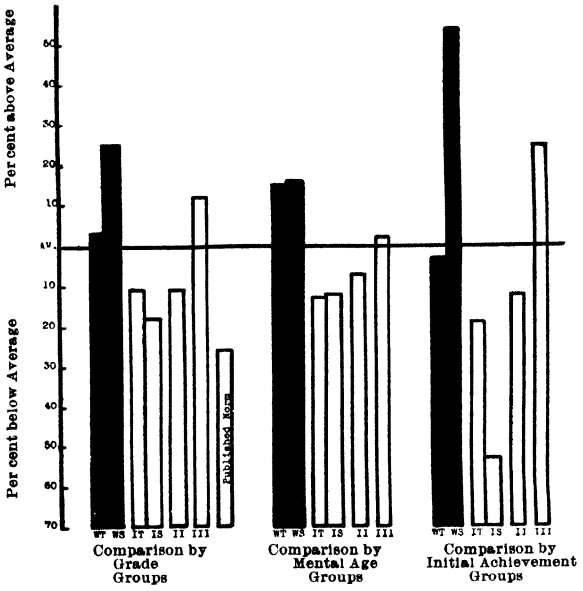



FIGURE XII. LANGUAGE

This figure compares the children of the four schools by grade groups, mental age groups, and initial achievement groups with the average score for all schools studied. Read this graph as follows: The grade comparison shows the Winnetka "test" group to have made a score 3% above the average, the "supplementary" group, 25% above the average; School I "test" group scored 11% below the average, etc. Compared by mental ages, WT and WS scored 15% and 16% above average, etc.

school individually, and in the case of the grade groups, with the published norm.[9]

It is interesting to note how similar the three graphs are. In each one, either the Winnetka "supplementary" group, or both Winnetka groups lead, and this is true whether we consider grade groups or mental age groups or progress. In all cases School III comes second and Schools I and II rank about together.

Where the Winnetka children are compared to the others by grades or starting points, the "test" group is decidedly inferior to the "supplementary" group, but where the children are grouped according to mental ages, the "test" group is practically on a par with the "supplementary" group. In comparing the Winnetka classes with established norms,[10] it was found that the "test" classes averaged 134 and the "supplementary" groups, 133 per cent of the norms.

There is little doubt but that the Winnetka children had an advantage on these formal language tests entirely apart from individual instruction. Punctuation and capitalization in Winnetka are taught by the correction-of-error method. The children are, therefore, quite accustomed to punctuating and capitalizing unpunctuated and uncapitalized sentences. While the Pressey tests differ materially in form from the Winnetka language tests to which the children are accustomed, they are nevertheless of the same general nature. Probably none of the other schools has given as much practice in this type of language work as have the Winnetka schools, where formal language has been on a strictly individual basis for four years.

In summary, then, Winnetka easily leads both standard norms and all the schools studied in formal language work, as measured by the Pressey tests. The nature of the practice work in Winnetka has familiarized Winnetka children with correction of er-

[9] The figures in Table XXIV compare the schools by taking an average of the percentages in capitalization and punctuation. To illustrate: the average per cents in Table XVIII were averaged with the average per cents in Table XIX to yield the scores by grades in Table XXIV.

[10] The only established norms given for the Pressey Language tests were for the sixth and seventh grades in the capitalization test, and for the seventh grade in the punctuation test.

ror tests. Formal language has been on an individual basis in Winnetka for four years.

### Arithmetic

Arithmetical ability was measured generally by the Cleveland Survey test and diagnostically by the Winnetka Individual Arithmetic Tests.

The results of the Cleveland Survey test[11] are shown in Table XXV, and in the accompanying graph. It will be seen that Winnetka "supplementary" groups exceeded the average of the schools studied by grade groups and by mental age groups and that they excelled all the other schools in progress. The "test" groups in Winnetka fell three per cent below average by grade comparisons, and the same amount by mental age comparisons, even though they excelled schools II and III. In progress, however, the Winnetka "test" groups also went above average.

A striking feature of the grade comparisons is the inferiority of Winnetka and all the other schools studied to the published norms for the Cleveland test, and particularly to the Grand Rapids norms. The average score of the schools studied is, indeed, only about 70 percent of the Grand Rapids norm. Since in every other subject the average of these schools has excelled published norms, and since they are all distinctly good schools, this result is puzzling.

A possible explanation may lie in the fact that the Grand Rapids children had daily practice on the Courtis materials, which are very similar to the Cleveland test. The same start and stop signals were used in giving the tests in Grand Rapids as were used in the daily Courtis exercises, and the time controls were often the same. The Winnetka children are accustomed to 3-minute tests and may have been confused by the 30-second time-limit in some of the Cleveland tests.

---

[11] The scores in the Cleveland Survey Arithmetic tests were the number of examples worked correctly, without regard for the number attempted. Score values, as given in Judd's chapter on the Cleveland Survey, were used for weighting and combining the various sections of the test in the results by grades.

TABLE XXV.—CLEVELAND SURVEY TEST. COMPARISON OF WINNETKA WITH OTHER SCHOOLS

(Showing per cent each score is of average median score of schools tested in terms of comparison: A, by grades; B, by mental ages; and C, by progress made)

| A. Grade Group | WT | WS | IT | IS | II | III | Per cent that G. R. Score is of Average |
|---|---|---|---|---|---|---|---|
| 3 | 1.24 | 1.08 | .95 | .97 | .85 | .89 | 1.01 |
| 4 | .82 | .83 | 1.01 | 1.48 | .81 | 1.05 | 1.52 |
| 5 | .97 | 1.07 | .98 | 1.22 | .76 | 1.00 | 1.71 |
| 6 | .86 | 1.13 | .96 | .90 | 1.21 | .94 | 1.56 |
| Average | .97 | 1.03 | .98 | 1.14 | .91 | .97 | 1.45 |

| B. Mental Age Group | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|
| 8- 9 | | 1.21 | .97 | 1.32 | .95 | .56 |
| 9-10 | 1.07 | 1.06 | .88 | 1.34 | 1.04 | .61 |
| 10-11 | .92 | 1.23 | .97 | 1.24 | .82 | .82 |
| 11-12 | 1.03 | 1.14 | 1.07 | 1.18 | .85 | .72 |
| 12-13 | .85 | .99 | 1.22 | 1.05 | 1.04 | .85 |
| 13-14 | .99 | .95 | .89 | 1.11 | | .99 |
| Average | .97 | 1.10 | 1.00 | 1.21 | .94 | .76 |

| C Starting Group | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|
| 1 Q | 1.79 | .92 | .91 | .95 | .70 | .74 |
| 2 Q | .64 | 1.37 | .60 | 1.45 | .94 | .79 |
| 3 Q | .63 | 1.48 | .63 | 1.03 | 1.09 | 1.14 |
| Average | 1.02 | 1.26 | .75 | 1.14 | .91 | .89 |

Whatever the cause of the relatively low record of the schools studied as compared with Grand Rapids (and, incidentally, with Cleveland and St. Louis), it can hardly be attributed to individual instruction, for the relatively low standing of Winnetka was shared by all the schools with which Winnetka was directly compared, and these other schools did not have individual instruction. School III supplements its class instruction by some individual work, but Schools I and II have almost pure class instruction in arithmetic.

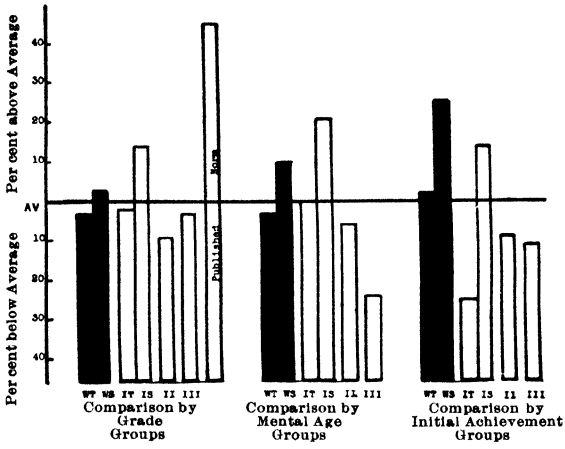



FIGURE XIII. CLEVELAND ARITHMETIC TESTS

This figure shows a comparison of all four schools by grade groups, by mental age groups and by initial achievement groups with the average of all schools studied. Read this graph as Figure XII was read.

TABLE XXVI.—WINNETKA TEST, ADDITION SPEED. COMPARISON OF WINNETKA WITH OTHER SCHOOLS

(Showing per cent each school's score is of average score: A, by grades; B, by mental ages; and C, by progress made)

| A. Grade Group | Average Score | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 4 | 2.33 | .86 | 1.29 | 1.07 | 1.29 | .86 | .64 |
| 5 | 4.10 | 1.48 | .98 | .98 | 1.10 | .73 | .73 |
| 6 | 4.46 | 1.18 | 1.12 | 1.01 | 1.01 | .90 | .78 |
| Average | | 1.17 | 1.13 | 1.02 | 1.13 | .83 | .72 |

| B. Mental Age Group | Average Score | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 9–10 | 3.45 | .80 | .87 | .87 | 1.16 | 1.30 | |
| 10–11 | 2.91 | 1.37 | 1.03 | 1.11 | 1.21 | .69 | .60 |
| 11–12 | 3.96 | 1.39 | 1.13 | 1.01 | 1.07 | .88 | 51 |
| 12–13 | 4.29 | 1.28 | .93 | 1.16 | 1.05 | .87 | .70 |
| 13–14 | 4.75 | 1.37 | 1.00 | .84 | 1.05 | | .73 |
| Average | | 1.24 | .99 | 1.00 | 1.11 | .94 | .64 |

| C. Starting Group | Average Progress | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 1 Q | 1.17 | .43 | .86 | 1.29 | 1.29 | 1.29 | .86 |
| 2 Q | .92 | 1.64 | .55 | 1.09 | 1.09 | 1.64 | 00 |
| 3 Q | .50 | 3.00 | 1.00 | 1.00 | 1.00 | 1.00 | −1.00 |
| Average | | 1.69 | .80 | 1.13 | 1.13 | 1.31 | −.05 |

TABLE XXVII.—WINNETKA TEST, SUBTRACTION SPEED
(Construction like Table XXVI)

| A. Grade Group | Average Score | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 4 | 5.16 | 1.36 | 1.74 | .39 | 1.36 | .58 | .58 |
| 5 | 9.1 | 1.60 | 1.10 | .83 | .93 | .71 | .82 |
| 6 | 10.46 | 1.17 | 1.29 | .91 | .86 | .95 | .81 |
| Average | | 1.38 | 1.38 | .71 | 1.05 | .75 | .74 |

| B. Mental Age Group | Average Score | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 9–10 | 5.05 | 1.39 | 1.29 | .59 | 1.38 | .35 | ..... |
| 10–11 | 7.3 | 1.64 | 1.77 | .61 | 1.02 | .55 | .41 |
| 11–12 | 7.7 | 1.43 | 1.30 | .98 | 1.11 | .65 | .52 |
| 12–13 | 10.5 | 1.24 | 1.19 | .90 | .86 | .95 | .86 |
| 13–14 | 11.4 | 1.12 | 1.18 | .90 | 1.05 | ..... | .75 |
| Average | | 1.36 | 1.35 | .80 | 1.08 | .63 | .64 |

| C Starting Group | Average Progress | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 1 Q | 2.60 | ..... | .96 | .58 | 1.73 | .96 | .77 |
| 2 Q | 2.25 | .89 | 1.33 | .67 | 1.11 | 1.44 | .56 |
| 3 Q | 1.88 | .53 | 1.60 | 1.07 | .80 | ..... | ..... |
| Average | | .71 | 1.30 | .77 | 1.21 | 1 20 | .67 |

TABLE XXVIII.—WINNETKA TEST, MULTIPLICATION SPEED
(Construction like Table XXVI)

| A Grade Group | Average Score | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 5 | 1.25 | 1.20 | 1.06 | 1.20 | 1.20 | .80 | .54 |
| 6 | 1.61 | 1.24 | 1.24 | 1.13 | .93 | .62 | .83 |
| Average | | 1.22 | 1.15 | 1.17 | 1.07 | .71 | .69 |

| B. Mental Age Group | Average Score | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 11–12 | 1.36 | 1.47 | 1.10 | 1.10 | 1.10 | .73 | .49 |
| 12–13 | 1.50 | ..... | .99 | 1.32 | .99 | .85 | .85 |
| 13–14 | 1.67 | ..... | 1.00 | 1.00 | 1.20 | 1.20 | .60 |
| Average | | 1.47 | 1.03 | 1.14 | 1.10 | .93 | .65 |

| C. Starting Group | Average Score | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 1 Q | .67 | ..... | 1.50 | ..... | 1.00 | 1.00 | .50 |
| 2 Q | .47 | ..... | 1.07 | 1.07 | 1.07 | 1.07 | . 71 |
| 3 Q | .22 | ..... | 1.50 | 1.50 | .00 | ..... | ..... |
| Average | | | 1 36 | 1 20 | 69 | 1 04 | 61 |

The diagnostic study was carried out by using the Winnetka Individual Arithmetic Tests, which are so constructed as to test every element or every difficulty of each process. Tests were given in column addition, advanced subtraction, compound multiplication, long division, and the four processes applied to fractions. The following tables and graphs show the resulting comparisons. All comparisons are based on the average number of rights in three minutes.

In every process and in almost every grade or mental age group Winnetka leads. It must be remembered, however, that the Winnetka children were thoroughly familiar with the form,

TABLE XXIX.—WINNETKA TEST, DIVISION SPEED
(Construction like Table XXVI)

| A. Grade Group | Average Score | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 5 | 2.19 | 1.37 | 1.14 | .91 | 1.22 | .68 | .68 |
| 6 | 3.31 | 1.11 | 1.00 | 1.11 | .91 | 1.11 | .76 |
| Average | | 1.24 | 1.07 | 1.01 | 1.07 | .90 | .72 |

| B. Mental Age Group | Average Score | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 11–12 | 2.49 | 1.33 | 1.07 | .90 | 1.07 | 1.06 | .56 |
| 12–13 | 2.76 | ..... | 1.08 | .97 | 1.18 | 1.16 | .61 |
| 13–14 | 3.38 | ..... | .89 | 1.09 | 1.09 | 1.12 | .81 |
| Average | | 1.33 | 1.01 | .99 | 1.11 | 1.11 | .66 |

| C Starting Group | Average Score | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| 1 Q | 1.23 | 1.02 | 1.36 | ..... | .81 | 1.22 | .61 |
| 2 Q | .54 | ..... | 2.31 | .24 | .46 | ..... | ..... |
| 3 Q | .77 | ..... | 1.30 | .87 | .55 | 1.30 | ..... |
| Average | | 1.02 | 1.66 | .56 | .61 | 1.26 | .61 |

TABLE XXX.—WINNETKA TEST, FRACTIONS (SPEED). COMPARISON OF WINNETKA WITH OTHER SCHOOLS

| | Average Score | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|---|
| Grade 6* | 5.60 | .83 | 1.32 | .84 | .62 | 1.49 | .90 |

* As only he children in the sixth grade took the test in fractions, the numbers of children were too small to divide into mental age groups and initial achievement groups.

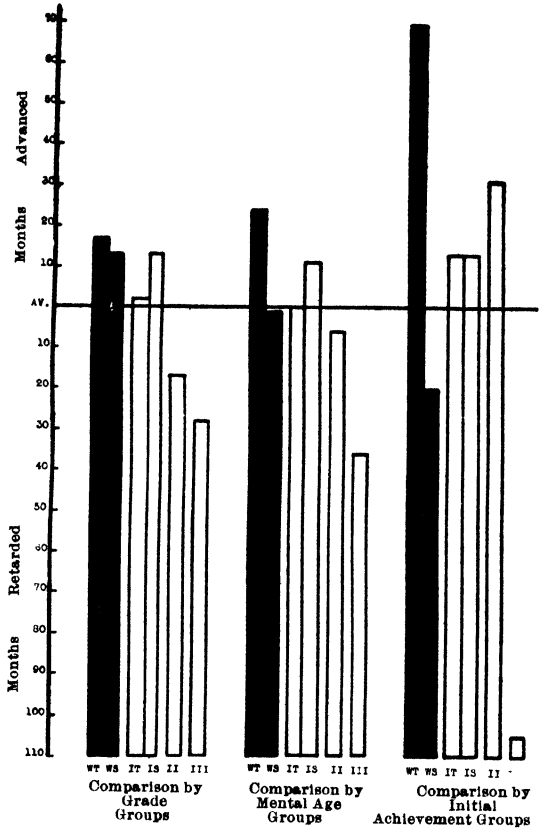



FIGURE XIV. WINNETKA ADDITION TEST. (SPEED)

In this graph the scores (number of rights in three minutes) on the Winnetka addition test are compared for each of the four schools with the average scores of all.

arrangement, time element, and type of test given, while the other schools were not. All schools had used these tests in September, of course, but Winnetka children had used various forms of the tests for two or three years. This gave them an unquestioned advantage.

Regardless of this, the Winnetka children evidently have learned, through individual instruction, the material which the Winnetka schools are trying to teach them, in each type of arithmetic work.

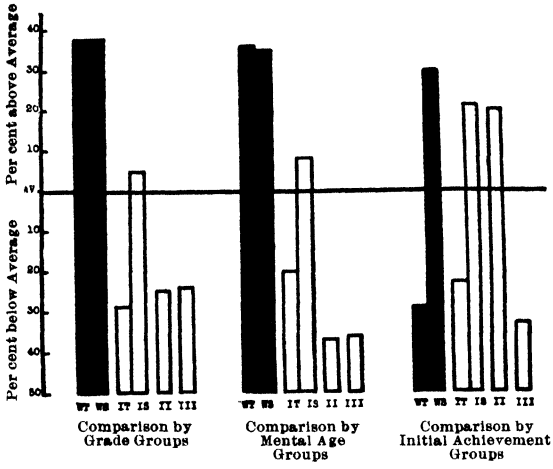



FIGURE XV. WINNETKA SUBTRACTION TEST. (SPEED)

In this graph the scores (number of rights in three minutes) on the Winnetka subtraction test are compared for each of the four schools with the average scores of all.

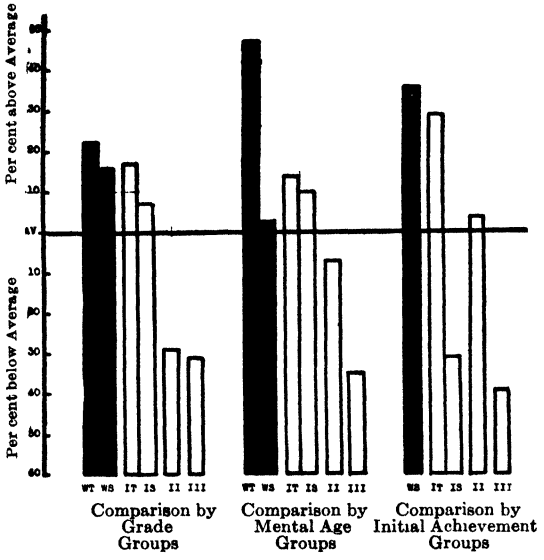



FIGURE XVI. WINNETKA MULTIPLICATION TEST. (SPEED)

In this graph the scores (number of rights in three minutes) on the Winnetka multiplication test are compared for each of the four schools with the average scores of all.

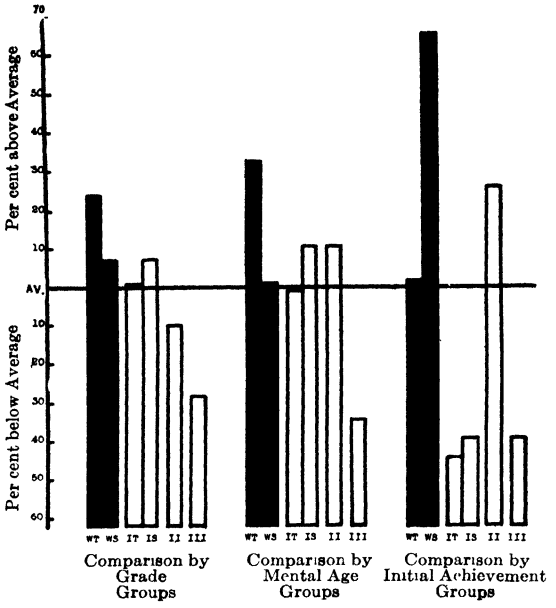



FIGURE XVII. WINNETKA DIVISION TEST. (SPEED)

In this graph the scores (number of rights in three minutes) on the Winnetka division test are compared for each of the four schools with the average scores of all.

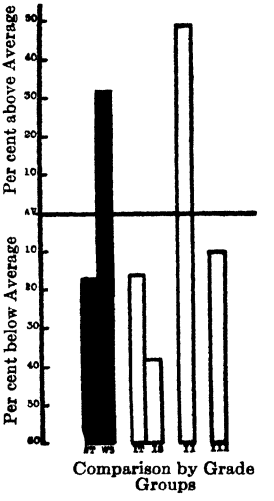



FIGURE XVIII. WINNETKA TEST IN FRACTIONS. (SPEED)

This graph gives a comparison by grade groups between the scores of each of the four schools studied and the average of all schools studied.

Table XXXI and its accompanying graph summarize the accuracy[12] scores of the different schools when arithmetic tests for all processes are combined. This leaves no doubt as to Winnetka's achievement with respect to accuracy.

TABLE XXXI.—WINNETKA ARITHMETIC TESTS. AVERAGE ACCURACY

(February Results by Average of Grade and Mental Age Groups)

| Group Basis | WT | WS | IT | IS | II | III |
|---|---|---|---|---|---|---|
| Grades | 1.04 | 1.11 | .94 | 1.03 | 1.00 | .87 |
| Mental Ages | 1.10 | 1.05 | .98 | 1.04 | .99 | .83 |

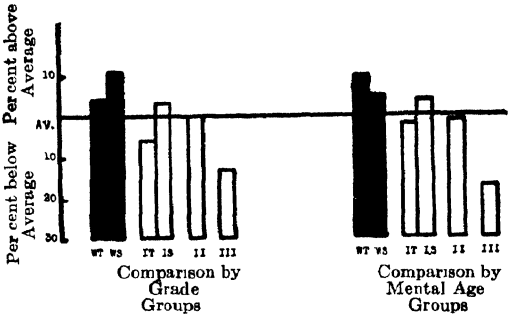



FIGURE XIX. WINNETKA ARITHMETIC TEST. (ACCURACY)

This figure compares the four schools by grade groups and mental age groups in accuracy scores on the arithmetic tests. The accuracy scores (per cent of rights out of attempts) were averaged for addition, subtraction, multiplication, division, and fractions.

Summarizing for arithmetic, Winnetka for the most part leads the schools studied in general arithmetical ability and in each arithmetical process. Together with the other schools, however, Winnetka falls far below the published norms in speed for the Cleveland Test. Winnetka's relatively high speed on the Winnetka Individual Arithmetic tests is at least partly due to the fact that the children are familiar with this type and form of

[12] Accuracy was counted as the per cent that the number of rights was of the number of attempts.

test. Winnetka's accuracy in arithmetic is, on the whole, greater than that of any of the schools studied.

## Conclusion

A picture—or rather three pictures—of the general results of the 28,000 tests is given in Figures XX, XXI, and XXII. In each of these there is one straight line representing the average of all the schools studied. Winnetka is then shown grade by grade, mental age group by mental age group, and initial achievement group by initial achievement group, in comparison with this general average. There is a comparison of this sort for each subject in which tests were given. A final summary, Table XXXII, and Figure XXIII, is then given, in which "test" and "supplementary" groups are combined, and the standing of each mental age group of all Winnetka children is compared with the average of all the schools studied, subject by subject.

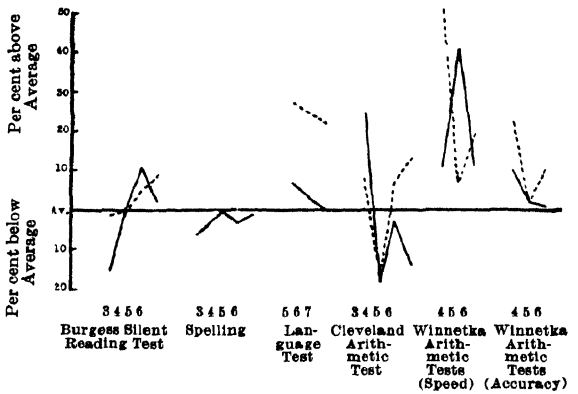



**Figure XX. General Summary of Test Results by Grades**

**This figure summarizes the results of all the tests by grades comparing Winnetka with the average of all schools studied. This average is represented by a heavy black line. The Winnetka "test" classes are represented by the heavy lines zigzagging back and forth on either side of the line representing the average. The Winnetka "supplementary" classes are represented by dotted lines. Read the chart as follows: In the Burgess Silent Reading Test the Winnetka "test" third grade had a score which was 15% below average. The score of the "supplementary" third grade was 1% below average. The score of the "test" fourth grade was exactly average and that of the supplementary fourth grade was also exactly average. The Burgess score for the "test" fifth grade was 10% above average, and that of the "supplementary" fifth grade was 5% above average, etc. In this graph there is only one line for spelling which represents the group of children as a whole; these figures represent the score on the spelling words which were studied.**

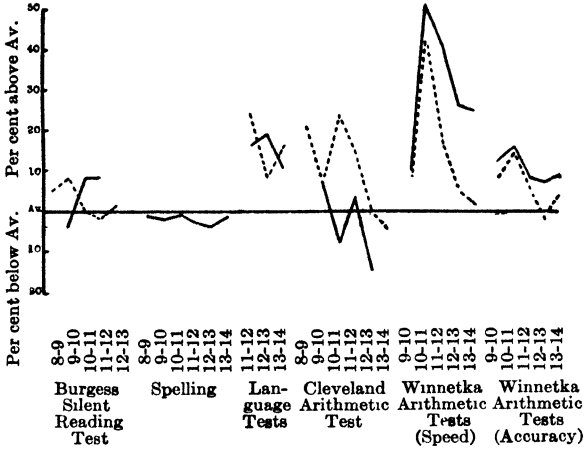



FIGURE XXI. GENERAL SUMMARY OF THE TEST RESULTS BY MENTAL AGE GROUPS

This figure compares the "test" and "supplementary" children in Winnetka by mental age groups with the average scores of the mental age groups in all schools studied. Read the chart as follows: "In the Burgess Silent Reading Test there were not enough children in the "test" group of the mental age 8 – 9 to justify taking a median. The "supplementary" children of mental age 8 – 9 had a Burgess score which was 5% above the average for that mental age. The 9 – 10 mental age group of the "test" class had a score which was 4% below the average for that mental age in all schools studied. In mental age 9 – 10 the "supplementary" group had a median score which was 8% above the average score for that mental age in all schools studied, etc. As in Figure XX there is no division into "test" and "supplementary" groups for the spelling test.

The striking thing about all four graphs is, that the lines representing Winnetka are above the lines representing the general average far more often than below it. This is more markedly true, of course, in the mental age comparisons than it is in the grade comparisons, for in the mental age comparisons Winnetka's disadvantage, as the result of relatively lower mental age for each grade, is largely wiped out. The graphs show clearly that Winnetka is doing a distinctly good job in reading; that in spelling ability Winnetka runs slightly below the other schools; that Winnetka excels in formal language and in arithmetical speed and accuracy, as shown by the Winnetka tests, and is at least equal to the other schools in arithmetical ability as shown by the Cleveland Survey tests.

The variation that exists among classes in Winnetka is clearly shown by the wide differences that sometimes exist between "test" and "supplementary" groups. These differences must be attributed to differences among teachers, and differences among the children themselves.

The survey in general, then, shows that in the grades and subjects tested, the Winnetka schools are doing distinctly effec-

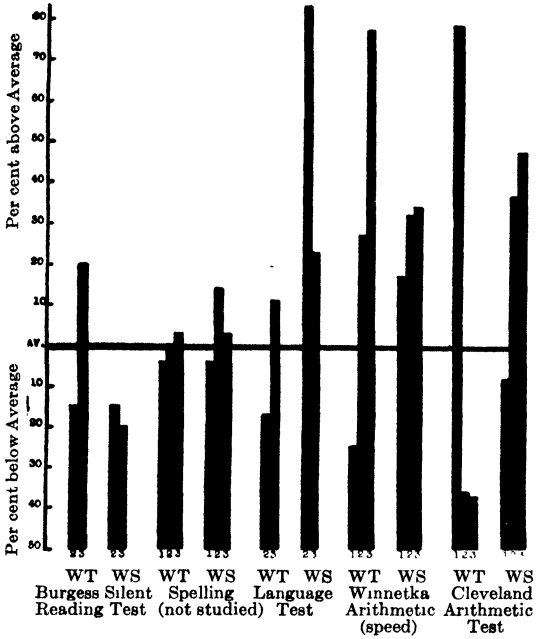



FIGURE XXII. GENERAL SUMMARY OF THE TEST RESULTS BY PROGRESS OF INITIAL ACHIEVEMENT GROUPS

This graph compares the progress of the "test" and "supplementary" initial achievement groups with the average progress made by the corresponding groups in all schools studied. Read the graph as follows: In the Burgess Silent Reading Test the "test" group with an initial (September) achievement of two paragraphs read, made progress which was 15% below the average progress made by the corresponding group in all schools studied. In this same "test" group those with an initial achievement of three paragraphs made a progress of 20% above the average progress of the corresponding groups in all schools studied. Winnetka "supplementary" children with an initial achievement of two paragraphs made progress in the Burgess Reading Test which was 15% below the average progress, etc. In this graph the progress in spelling not studied has been measured since it was impossible to compare progress in the spelling words studied.

tive work—work which on the whole is more efficient, as measured by the various tests which were used, than that done by comparable schools which use class methods of instructions.

TABLE XXXII.—PER CENT THAT WINNETKA SCORES ARE OF THE AVERAGE SCORE OF SCHOOLS STUDIED

("Test" and "Supplementary" Winnetka groups are here combined)

| Test | M. A. 8–9 | M. A 9–10 | M A. 10–11 | M. A. 11–12 | M. A. 12–13 | M. A. 13–14 |
|---|---|---|---|---|---|---|
| Burgess Silent Reading | 1.13 | 1.06 | 1.03 | 1.02 | 1.02 | ..... |
| Spelling | .99 | .98 | .99 | .97 | .96 | .98 |
| Language | ..... | ..... | ..... | 1.23 | 1.13 | 1.16 |
| Cleveland Arithmetic | 1.27 | 1.08 | 1.11 | 1.16 | .98 | 1.00 |
| Winnetka Arithmetic (Speed) | ..... | 1.08 | 1.60 | 1.35 | 1.11 | 1.06 |
| Winnetka Arithmetic (Accuracy) | ..... | 1.10 | 1.20 | 1.06 | .98 | 1.06 |

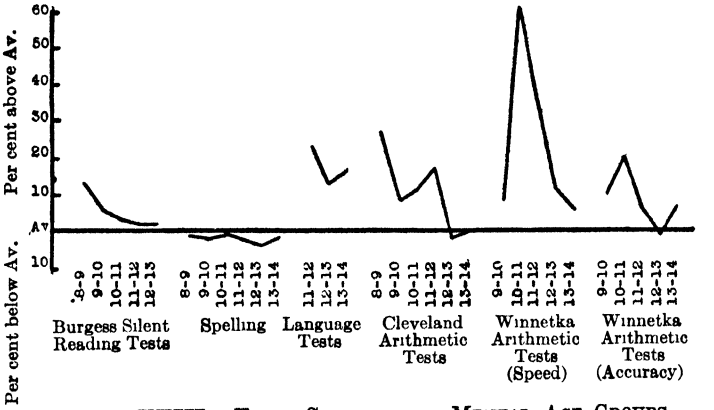



FIGURE XXIII. FINAL SUMMARY BY MENTAL AGE GROUPS
(Lumping Test and Supplementary Groups)

This figure tells a story similar to the one which Figure XXI tells. The only difference between the two graphs is that in Figure XXI the "test" and "supplementary" groups have been kept separate. In Figure XXIII these two groups have been lumped together and one general score compared with the average score for all schools studied.

# CHAPTER VII

## EFFECT ON HIGH-SCHOOL SCHOLARSHIP

Do children who have had their elementary training under the Winnetka technique do satisfactory work in high school?

Children who graduate from the elementary schools in Winnetka go to a township high school which is also attended by children from two similar towns, a very small, exclusive one, and the outlying rural district. The Winnetka children constitute about one-fifth of the enrollment of this township high school. The high school is under a different administration and board of education and is conducted on a regular class basis.

How does the work of the Winnetka children, in this high school, compare with that of children from schools which use the regular class system?

Comparisons are available for four successive freshman classes—children entering the high school in 1921, 1922, 1923, and 1924. The data on the earlier of these classes, however, are not complete and have relatively little significance from the standpoint of the present study. The children entering High School in 1924 are the only ones who had as much as half of their elementary training under the present organization of the Winnetka Schools. It is interesting to note, however, that the class entering high school from Winnetka in 1921 made a record, if anything, a little below the average of the rest of the township. The 1922 freshmen made a somewhat superior record and the 1923 freshmen a better one. The record of the 1924 freshmen is presented on the next page. Whether or not the progressive improvement of these classes was due to the increasing amount of training each had had under the Winnetka individual technique is not definitely determined by this investigation. It is significant, however, that the two factors are strikingly parallel.

The comparison of 1924 freshmen was made by the research department of the New Trier Township High School. The comparisons for the first and second semesters are similar in import;

that for the second semester is given here, as being the most recent data available.

The homogeneity of Winnetka, School I and School V, the three principal villages of the township, and that of the township as a whole, is obvious to any observer, the exclusive, 'high brow' little village of Kenilworth being counterbalanced by the outlying rural district. This is shown clearly also by intelligence tests. The scores of 1924-25 freshmen on the Otis Self-Administering test were as follows:

| | |
|---|---|
| Winnetka | 59.8 |
| School I | 58.5 |
| School V | 59.2 |
| Entire Township | 59.4 |

The differences are too small to be significant.

Winnetka is represented by 78 children in the 1924-25 freshman class; the balance of the township by 312. The average scholarship grades given in the principal subjects and the average for all subjects are shown in Table XXXIII and Figure XXIV. The per cent of failure in these subjects, for the freshmen from Winnetka and the other schools, is shown in Table XXXIV and

TABLE XXXIII.—SCHOLARSHIP AVERAGES FOR FRESHMEN GROUPS FROM THREE SCHOOLS AND ENTIRE TOWNSHIP

| School | English | Math. | Soc. Sci. | Latin | All Subjects |
|---|---|---|---|---|---|
| Winnetka | 2.35 | 2.38 | 2.22 | 2.02 | 2.24 |
| School I | 2.05 | 2.13 | 2.13 | 2.07 | 2.10 |
| School V | 2.40 | 2.04 | 2.00 | 1.39 | 1.99 |
| All Schools | 2.17 | 1.29 | 2.13 | 1.98 | 2 12 |

TABLE XXXIV.—PERCENTAGE OF FAILURE OF FRESHMAN GROUPS FROM THE THREE SCHOOLS AND ENTIRE TOWNSHIP

| School | English | Math | Soc Sci | Latin | All Subjects |
|---|---|---|---|---|---|
| Winnetka | 5.2 | 4.0 | 6.7 | 8.5 | 6.0 |
| School I | 3.7 | 7.9 | 8.7 | 14.2 | 7.1 |
| School V | 0.0 | 16.7 | 5.0 | 27.8 | 10.2 |
| All Schools | 5.4 | 7.4 | 5.8 | 12.0 | 7.5 |

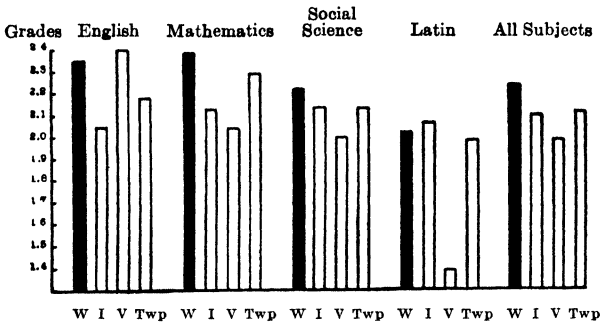



FIGURE XXIV. SCHOLARSHIP OF HIGH SCHOOL FRESHMEN

Read this graph as follows:

In English, the freshmen from the Winnetka schools averaged 2.35. The pupils from School I averaged 2.05, those from School V, 2.40, while the average grade for the entire freshmen class was 2.17.

In Mathematics, the Winnetka children made an average grade of 2.38; those from School I averaged 2.13, those from School V, 2.04, while the entire freshman class averaged 2.29 in mathematics.

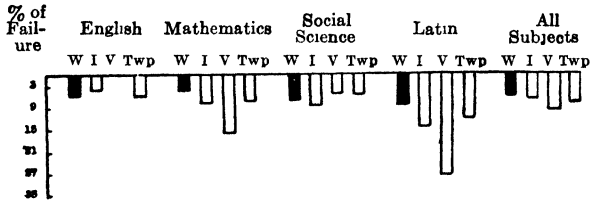



FIGURE XXV. FAILURES OF HIGH SCHOOL FRESHMEN

Read this graph as follows:

Of the children taking English, the percentage of failure among the children from Winnetka was 5.2. The per cent of failure among the children of School I was 3.7. There were no failures among the children from School V. The average per cent of failure for all the freshmen was 5.4.

Figure XXV. According to the marking system at New Trier, "A" scholarship scores 5, failure, 0.

The above tables and graphs show that the children in Winnetka are more than holding their own in the township high school, to which they go.

It has been impossible to get accurate scientific data as to their social efficiency in the high school. It is interesting to note, however, that in the same freshman class for which the above figures are given, three out of four of the class officers were Winnetka children, although the Winnetka children form only about

one-fifth of the entire freshman enrollment. The oral statements by the principal of the high school indicate that there is no apparent lack of social efficiency on the part of children coming from the Winnetka Schools.

### *Summary*

Winnetka children go to the same township high school as do those of two similar suburbs and the remainder of the township. A comparative study of the high school freshmen from Winnetka and those of these other communities shows that Winnetka freshmen have made a better record in three out of four major subjects and in an average of all subjects than have those of the other communities. Individual instruction in the elementary schools apparently does not interfere with the success of children who have to attend a high school conducted on a class basis; indeed it seems to make for success.

# CHAPTER VIII

## CONTROLLED EXPERIMENTS

Are individual progress and self-instruction, *per se,* more efficient or less efficient than group or class instruction, as shown by controlled and limited experiments?

Do the children who work individually progress more rapidly or less rapidly than those who are taught by the ordinary class method?

To answer these questions, six experiments were carried on: two in the Winnetka Schools, one in School I, one in School II, and two in School III. These included an experiment in compound multiplication and long division, carried on in a 4th grade of each school, and spelling experiments conducted in a 6th grade in Winnetka and in a 3rd grade in School III.

### Experiments in Arithmetic

The compound multiplication and long division experiments did not begin until the children had been in school long enough to have a thorough review of addition, subtraction, simple multiplication, and short division. The experiment in School I was begun in November, while the children in School III were not ready to begin until March.

As soon as the 4th-grade children were ready to begin compound multiplication, they were given the National Intelligence Test and Winnetka Arithmetic Tests in column addition, simple subtraction, multiplication facts, simple multiplication, and short-division. An average arithmetic[1] score and a National Intelligence Test score were then found for each child.

[1] An average arithmetic score was found in the following manner: Each child was scored on each test in terms of the number of correct examples completed in a given time. A median score for each test was found for each school and each child's score on that test was reduced to a percentage of the median score of his school. The child's percentages of the median scores in column addition, simple subtraction, multiplication facts, simple multiplication, and short division were averaged to yield an average score for arithmetic.

The children were now divided into two equivalent groups on the basis of average arithmetic score, National Intelligence point score, and chronological age. On these three bases the averages of the top fourth of each group, that of the bottom fourth, and that of each of the two middle fourths, were practically equal in all three measures.

Both groups in any one school were taught by the same teacher. Both groups used the Winnetka individual instruction books for compound multiplication and long division. Both groups were taught for the same length of time each day, and the group which was instructed first during one part of the time was, so far as possible, instructed second during the next part of the time.

The class group moved forward at a uniform rate; the teacher presented each step to the class as a whole and gave each individual such help as she would under ordinary class conditions. This individual help included individual remedial work, provided this remedial work came during the regular arithmetic period.

Children in the individual group followed the usual Winnetka technique of practice work on each step. They read the explanation and presentation of each step as it was taken up in their books. They did all the examples of Set A for the step, comparing their answers with the answers in the back of the book. If they had done these examples entirely correctly, they proceeded to the next step. If they missed any, they did the examples of Set B. If those were all correct, they proceeded to the next step. Otherwise they did Set C, and so on. The children corrected their own practice work under the supervision of the teacher. When they came to a practice test, they tested themselves with it, being timed by the teacher or a fellow pupil. When they did a practice test without making any errors, they were given a formal test by the teacher. They continued to practice and to take the tests until they reached the Winnetka standard for speed and accuracy. They then proceeded to the next section of their arithmetic work.

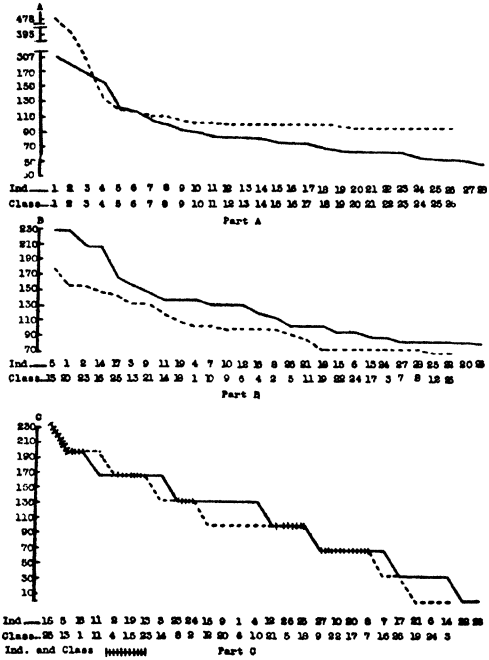



FIGURE XXVI. SCHOOL I—MULTIPLICATION EXPERIMENT

The solid line represents children taught under the individual method, the dotted line children taught by the class method in all cases. The crossed line represents both children taught under the individual method and those taught under the class method.

A—Comparison of amount of work done per day under individual and class methods.

Read this graph as follows: The best pupil in the class group did 4.78 times (478 per cent) as much per day as did the average child in the class group. The next child in the class group did 395 per cent as much work as the average. The third child in the class group did 170 per cent as much, etc. The best child in the *individual* group did 3.07 times (307%) as much work per day as did the average child in the class group. The next best child did 180 per cent as much work; the third child did 165 per cent as much work, etc.

B—Comparisons of speed scores in retention test of children taught under individual and class methods.

Read this graph as follows: The best pupil in the individual group made a speed score 2.30 times (230 per cent) as great as the average speed of the class group. This child is number 5 in graph A. Another child in the individual group made the same score, this child being number 1 in graph A. The third child in the individual group made a score of 208 per cent of the average of the class group, this child being the same one as number 2 in graph A, etc. The best child in the class group made a score of 178 per cent of the average, the next best child 155 per cent, etc., these children being the 15th and 20th respectively in rank order in graph A.

C—Comparison of accuracy scores in retention test of children taught under individual and class methods.

Read this graph exactly like graph B, substituting accuracy for speed. The numbers below still refer to the rank order of the children in graph A, each number referring to the same child in all three graphs.

An exact record was kept of the number of days required by each pupil to reach this standard.

Retention tests were given in compound multiplication and long division in the fall of 1924, after the summer vacation had elapsed and the children had had two weeks of school in which to 'brush up.' The results of these retention tests are shown in Figures XXVI and XXVII.

Figure XXVI shows the average amount of work done per day in compound multiplication in School I. Each child is plotted separately, so that the graph affords a profile of the entire class. It will be seen by this graph that the average amount of work accomplished per day was distinctly greater for the class method group, and this appears to have been true all along the line. The fact that three children of the class group completed their work in a remarkably short time is due to the fact that they were absent much of the time, but had to finish their work when the rest of the class did.[2]

In general, the individual group made better scores in accuracy and much better scores in speed than did the class group, but it apparently took them longer to reach this proficiency. They had, of course, never worked by the method of individual instruction before.

Figure XXVII shows how these same children mastered long division. Here, the individual group apparently had caught the idea of individual instruction. They shot far ahead of the class group in the amount of work accomplished per day. In their retention test, however, they did not do quite as well as in compound multiplication. Their speed was apparently somewhat better than that of the class group, but their accuracy on the whole is a little lower. The differences between the two groups, however, in either speed or accuracy are so small as to fall within the lim-

[2] These same children do not appear to have lost very seriously by their absence, since child 1 appears in the third place on the accuracy test and in the tenth place on the speed test in multiplication. Child 2 ranks at about the middle of his class in multiplication speed and tenth from the top in multiplication accuracy. Child 3, on the other hand, appears to have suffered by his absence. He was one of the slowest workers in the final test and made a score of zero.

its of chance, whereas, the difference in the amount of work accomplished per day is so large as to be distinctly significant.

The results from School II, while differing in some particulars, on the whole tend to confirm those of School I.

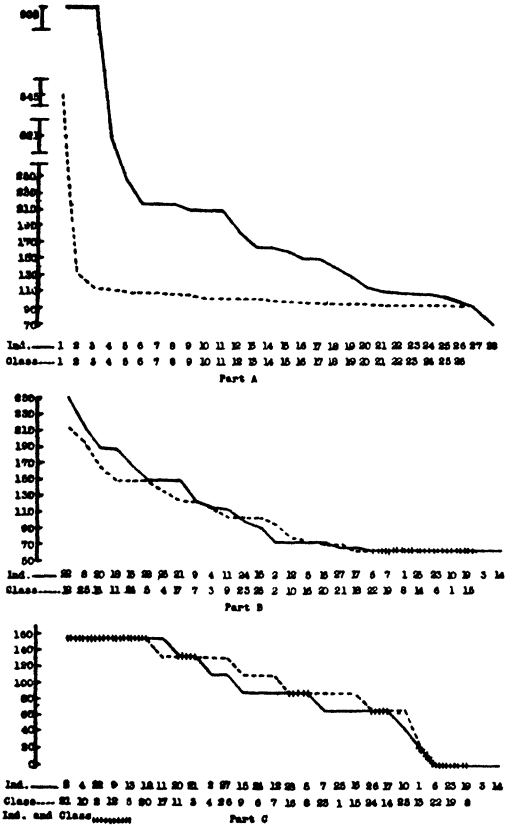


FIGURE XXVII. SCHOOL I, LONG DIVISION EXPERIMENT
Read this graph exactly like Figure XXVI.

The amount of work accomplished per day in learning multiplication was, if anything, a little greater for the class group than for the individual group. The amount learned per day for division, however, after the children had been adapted to the individual method, is much greater for the individual group.

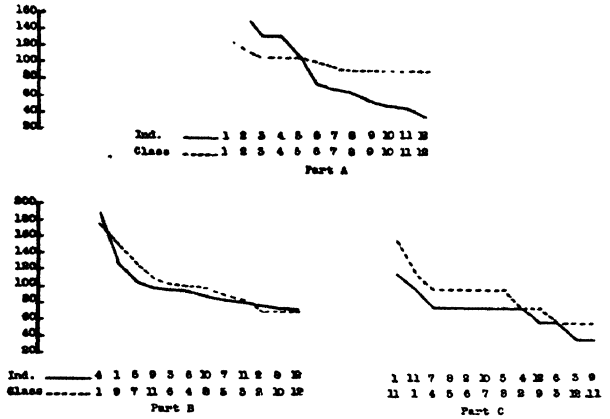


FIGURE XXVIII. SCHOOL II MULTIPLICATION EXPERIMENT
Read this graph exactly like Figure XXVI.

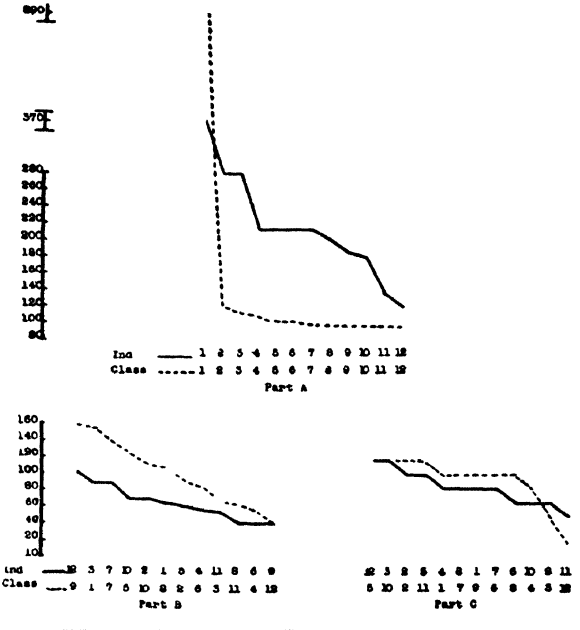


FIGURE XXIX. SCHOOL II LONG DIVISION EXPERIMENT
Read this graph exactly like Figure XXVI.

On the other hand, the results shown by the retention test are not so good for the individual group as for the class group. The differences here are not large, with the exception of division speed, where the individual group is distinctly below the class group.

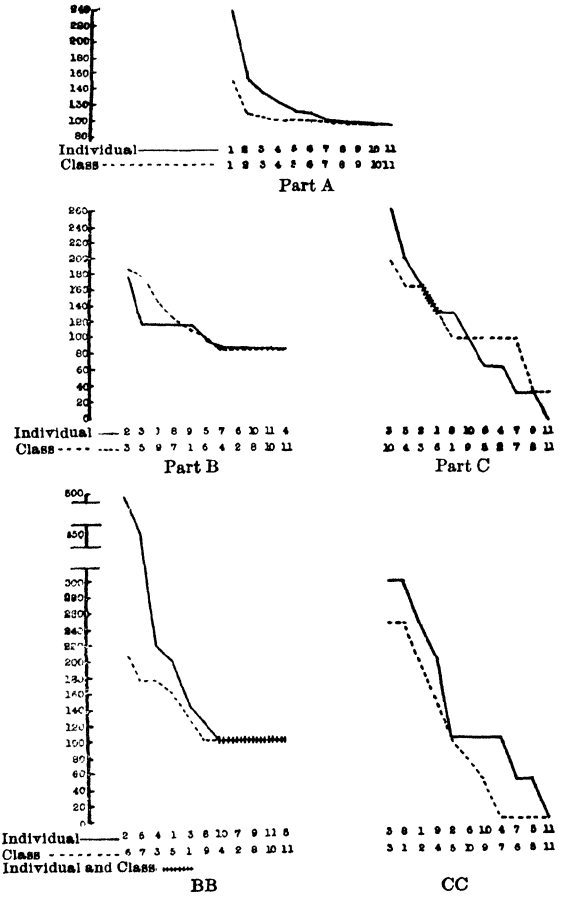



FIGURE XXX. SCHOOL III MULTIPLICATION AND LONG DIVISION EXPERIMENTS

In this graph both the multiplication experiment and long division experiment have been included. Part A compares the amount of work done per day under individual and class methods, lumping the time spent on compound multiplication and long division. Parts B and C compare the speed and accuracy scores for compound multiplication. Parts BB and CC compare the speed and accuracy scores for long division. Otherwise, this graph is read exactly like Figure XXVI.

In School III no separate record was kept of the time spent on long division and on compound multiplication. This may account for the fact that the difference in the amount of work done per day is not so great as in the case of the division experiment in the other two schools. The difference is, nevertheless, large enough to be significant. The individual group did considerably more work per day than did the class group. In the retention tests the differences in multiplication are not significant. The class group apparently made a little better speed, the individual group a little greater accuracy. In division there is a definite superiority on the part of the individual group. The results of the experiment in School III, therefore, would seem to be fairly conclusive in favor of the individual method over the partially individualized class method in use at that school.

In the Winnetka schools considerable difficulty was experienced in finding children who were ready to begin the experiment all at the same time. The progress spread of the Winnetka children was naturally large, since they had all had individual instruction for years. It, therefore, became necessary to delay the experiment until a whole class full of children had completed their 3d-grade work without having been allowed to go on to their regular 4th-grade arithmetic work. For this purpose the faster ones were allowed to begin fractions in order to 'mark time' until the slower ones were ready to begin compound multiplication. This brought the experiment so late in the year that it was possible to carry the experiment only through compound multiplication. The outcome is shown in Figure XXXI.

The results from this experiment at Winnetka are quite characteristic of the others, except that the difference in amount of work done per day is as great for compound multiplication in Winnetka as it is for division in the other schools. The Winnetka children are, of course, accustomed to individual materials. The graph representing amount of work done per day for Winnetka may probably be deemed a typical comparison of the individual with the class method. At least half the children made some saving in time, in many cases a large saving. Some chil-

dren did less work per day, since they were required to finish each section of the work thoroughly before going to the next. The resulting efficiency is also probably fairly characteristic.

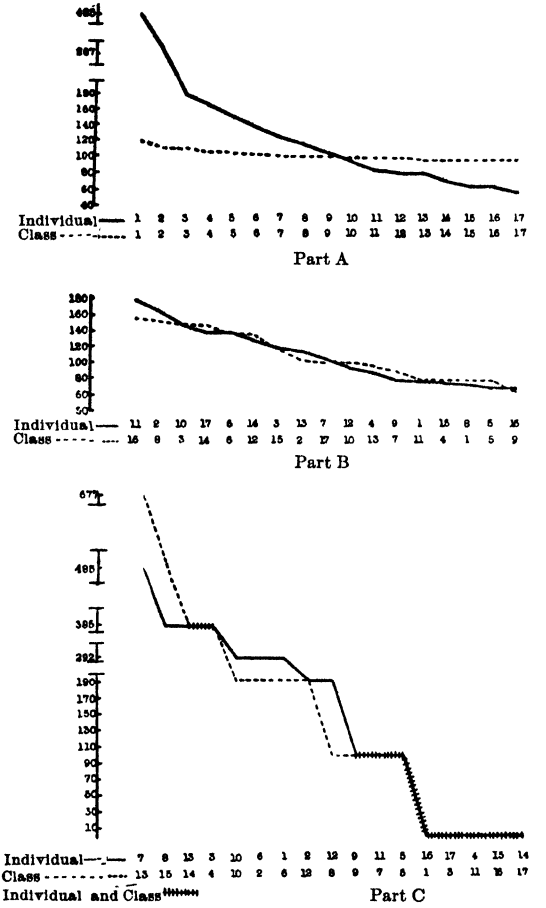



FIGURE XXXI. WINNETKA MULTIPLICATION EXPERIMENT
Read this graph exactly like Figure XXVI.

There appears to be no essential difference in the speed and accuracy of the two groups.

Summing up the experiments in arithmetic, it would seem that there is a distinct saving in time for the faster children

through the use of the individual method, and that in general there is not a material difference in the resulting speed and accuracy. For the slower pupils of the individual group there is presumably an increase in thoroughness and a saving of time for those who are so slow that under the class method they would be obliged to repeat grades. These facts have been brought out in Chapter III and Chapter VI.

The two groups taking part in the Winnetka experiment were reversed for an experiment in decimals. The group that had been taught compound multiplication individually was taught decimals as a class, and *vice versa.*

The experiment was conducted in the same way as that for compound multiplication and long division. The children were given only ten days, which makes the results inconclusive.

Figure XXXII gives the June test results of the decimal experiment.[3]

These results are not remarkably different from those obtained for the compound-multiplication and long division. They

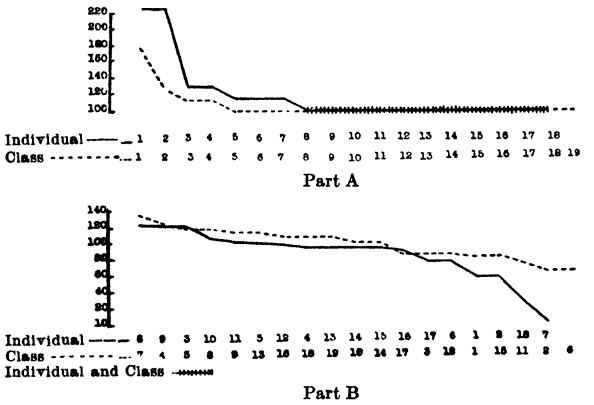



FIGURE XXXII. WINNETKA DECIMAL EXPERIMENT

Read Part A in this figure exactly like Part A in Figure XXVI. Part B is a comparison of the test scores in the decimal test. This test score is the number of examples correct. These tests were not graded separately on speed and accuracy.

[3] The test score in the decimal test is the number of examples correct. These tests were not graded on speed and per cent of accuracy.

show a time saving for the individual group, although naturally not so great a time saving as in the preceding experiments, owing to the limited period of the experiment. With the exception of four children in the individual group, the results of the retention test in decimals are about the same for both class and individual method. These last four children in the individual group, however, did distinctly poorer work than did the corresponding children in the class group.

## Experiments in Spelling

Spelling experiments were conducted in a 3rd grade in School III and a 6th grade in Winnetka.

### *Third-Grade Experiment, School III*

The purpose of the 3rd-grade spelling experiment in School III was to determine the relative efficiency of two methods of teaching pupils to spell, namely, the Winnetka individual plan, and a well-known partially individual plan.

The Winnetka individual method (described fully in the teacher's manual of the *Individual Speller,* World Book Co.) may be summarized as follows:

1. The entire list of words is dictated twice through to all the children.
2. On each child's printed list the words he has misspelled on either dictation are checked.
3. All the children are trained in the method of attacking spelling words, being given a definite technique.
4. Each child studies each day five of the words checked on his list.
5. The children are grouped as pairs, and each member of a pair dictates to the other the words that the other studied the day before.
6. The children correct this daily work themselves under the teacher's supervision.
7. On Fridays the children review the words of the week instead of studying new words.
8. On Mondays members of each pair dictate to eachother all the words studied by each during the preceding week. These words are corrected by the teacher.

9. All words missed on a weekly review test are studied the next day by each child missing them, in lieu of new words.

10. When a child's weekly review tests show him to have spelled correctly every word checked on his list, he drops spelling completely until time for the semester review test.

11. At the beginning of a new semester normally, but two weeks before the close of the experiment for present purposes, members of each pair, including all children who have finished their spelling and all others, dictate to each other all the checked words on their lists. These are corrected by the teacher. Any words missed are again studied until correctly spelled on a weekly review test.[4]

The partially individualized method consisted of the following steps:

1. A week's work consists of twenty new words and twenty review words.

2. The first day of the week the pupils are given a lesson in pronunciation of the twenty new words. These words are then dictated to the children. The children correct each other's papers. Then they write correctly the words which they have misspelled in this test.

3. On the second day the children study the words which they misspelled the day before. Those who made no errors are excused from this study period, but not from the succeeding test. The children are supervised during this study.

4. On the third day a test is given on the new lesson and on a review lesson which consists of the lesson of one month before. These words are corrected, the errors recorded, and the remainder of the period is spent on studying words missed in this test.

5. The next day is spent in studying words missed out of the previous day's test.

6. On the last day of the week a test is given on the new and the review lesson. The papers are corrected and the rest of the period is spent studying the words missed in the test.

[4] Normally, a child must get words right on two successive semester review tests to be finally exempt from further study. During this experiment there was not time for these successive semester reviews.

7. Records are kept from day to day of the number of errors and the words missed on each test given. Each pupil keeps a notebook in which he records all misspelled words in spelling tests and in papers written in connection with other subjects.

In School III this method was modified to some extent. Only those words which were missed by a number of children were taught to the class as a whole. These words were carefully presented with special emphasis on the difficult parts. Any child getting all the words correct in the pre-test was exempt from spelling for the week, except when review words were dictated and except for the Friday review test.

The essential differences between the completely individualized Winnetka method and the partially individual method with which it was compared are:

(1) The Winnetka method gave a pre-test of the entire word list (normally one semester's work), dictated twice through at the beginning. The partially individualized method provided for the dictation of twenty words each week.

(2) Under the Winnetka method children who had mastered the words misspelled in the pre-test were entirely freed from spelling for a relatively long period—a number of weeks—until time for the semester review test. Under the other method children who spelled well on Monday saved time Tuesday and Thursday, but had to work with the class at least part of Wednesday and Friday.

(3) Under the Winnetka method review words varied with the individual child, for each child was retested only on words he had once misspelled. Under the other method all children reviewed the same words.

The pupils of the class were divided into two parallel groups on the basis of (a) their accomplishment in a spelling pre-test of 250 words, (b) their intelligence quotient (Stanford-Binet test), and (c) their chronological age.

Both groups were taught by the same teacher for the same length of time each day. Both groups were taught the same list of words, the only difference being the method of instruction.

These two groups were then reversed and taught another list of words. The children who had progressed at their own rate on List I were taught List II as a class, and the children who were taught List I as a class progressed individually on List II.

A final test was given in June and the papers were scored on the number of words correct. The number of words learned and the number of days spent by each child were recorded.

The graph shows the results of the two groups in Lists I and II.

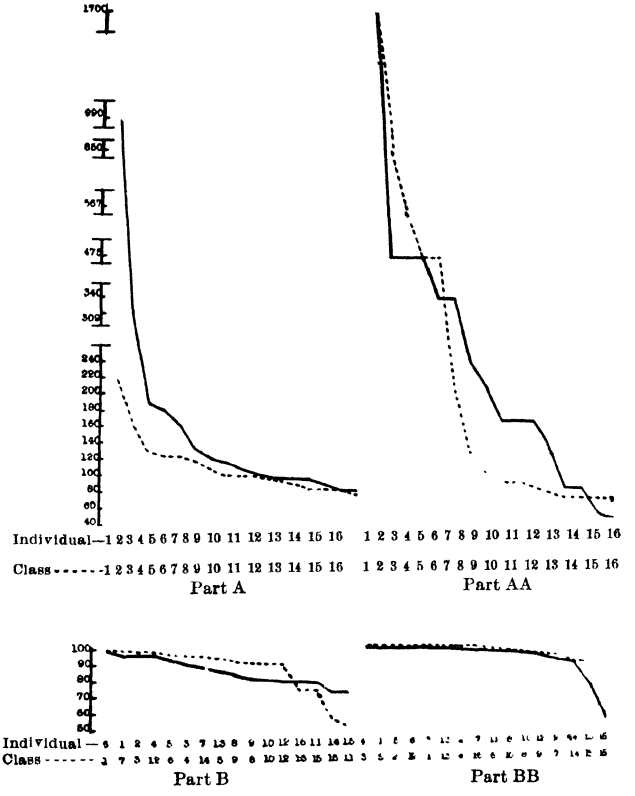



FIGURE XXXIII. SCHOOL III SPELLING EXPERIMENT

Part A is a comparison of the amount of work done per day under individual and partially individual method. Part B is a comparison of the percentage of words correct in a retention test of children taught under individual and partially individual methods. Parts A and B refer to List I. Parts AA and BB refer to List II, where the children were reversed. The numbers and percentages are read exactly like those in Figure XXVI.

The differences shown between the class group and the individual group are more marked in the case of List I than in the case of List II. Since the record shows that in List II one child in the class group worked 17 times as fast as the average, another child 8½ times as fast, another 5⅔ times as fast, etc., it is evident that the so-called 'class group' was very largely using individual methods in the second half of the experiment—much more so than in the first half. What we really have, then, is a comparison of two types of individual instruction, not a comparison of individual work with class work. The significance of both pairs of graphs, however, is clearly that on the whole the children taught by the more completely individual method saved more time, but that in the retention test the two groups were almost equal, with the exception of two or three children studying each list.

Let us consider List I first. The graph shows a very marked time-saving on the part of the children studying by the more individual method, but practically equal results in the retention test. The retention test scores of the individual group are more nearly uniform than those of the class group; the strictly individualized group ranges from 73 to 98 percent, while the less individualized group ranges from 52 to 99 percent.

When the two groups were reversed, the situation became less clear. While studying List II, each group seems to have had individual instruction to almost the same degree as the other. There is practically the same range in time taken by the various individuals in the strictly individual group and in the modified individual group. Whether this is because the children using the modified individual method had become accustomed to the strictly individual method, or whether there was some slight change in the technique of the teacher, is not known. On the whole, the strictly individual group saved some time, although not a significant amount. The retention test is again ambiguous. Most of the children in the two groups made almost exactly the same record, but two children in the strictly individualized group dropped decidedly below any of the children in the less individualized group.

Another and simpler method of comparing the results of these two experiments in School III is in terms of the average number of words learned per day by the children in each group. These results stand out more consistently, as shown in the following graph.

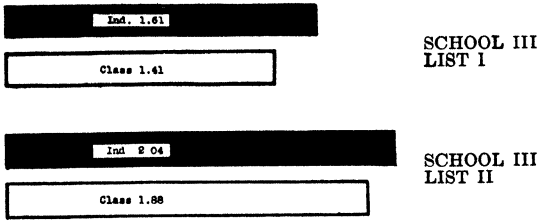



FIGURE XXXIV. SCHOOL III SPELLING EXPERIMENT

This graph shows the average number of words learned per day by the two groups of children: the group taught according to the individual method and the other group taught by the partially individual method. These figures are shown for List I and for List II. Read the graph as follows: On List I the group that was taught according to individual method learned on the average 1.61 words per day. The group that was taught according to the partially individualized method learned 1.41 words per day. When these groups were reversed and taught List II, the group that was taught according to the individual method learned 2.04 words per day, while the group which was taught according to the partially individualized method learned 1.88 words per day.

It is seen that the individual group, both on List I and on List II learned *and retained* a larger number of words *per day* than did the less individualized group. It is also seen that on List II this difference was not as great as on List I.

## SIXTH-GRADE EXPERIMENT, WINNETKA

Two Winnetka sixth grade classes were combined, then divided into two parallel groups according to (a) score in pre-test of 180 spelling words, (b) National Intelligence score, and (c) chronological age.

One group studied spelling according to the Winnetka individual plan and the other group according to the partially individual method. Both groups used the same books and were taught by the same teacher.

Figure XXXV presents the results of a retention test, given after the summer vacation:

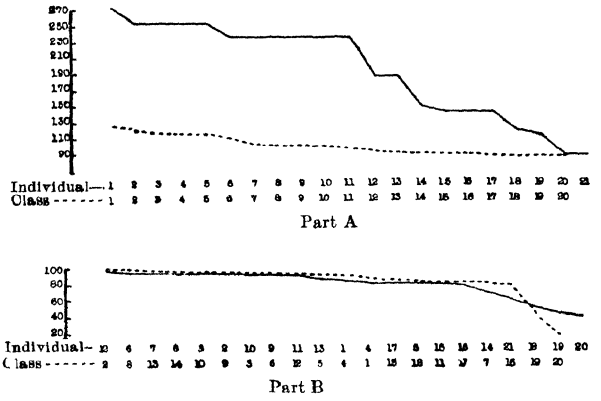



FIGURE XXXV. WINNETKA SPELLING EXPERIMENT

**Read this graph exactly like graph XXXIII. The only difference between this graph and graph XXXIII is that the Winnetka children had only one list of words.**

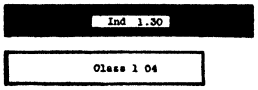
The difference between the two methods is much more clearly brought out by the Winnetka experiments than by those in School III. This is perhaps partly because the partially individual method was used exactly according to the manual, instead of in a more individualized form as at School III; and is still more because the Winnetka children were familiar with the completely individual method.

The graph shows a very marked saving of time by the individual method, with approximately equal retention. The less individualized group has retained a little more, but compared to the amount of time spent, the difference is not significant.

The results may be further summarized by comparison of the average number of words learned per day under the two methods, as shown graphically in Figure XXXVI, which confirms the experiments in School III.

The general conclusion from paired group experiments in spelling would seem to be this: A distinct time saving can be effected through individualizing spelling, the greater the amount

of individualization, the greater the time saving. There is apparently a slight loss in spelling efficiency through this time saving, but the loss is insignificant in comparison with the time saved. The actual average number of words learned per day under the




WINNETKA

FIGURE XXXVI. WINNETKA SPELLING EXPERIMENT

This graph shows the average number of words learned per day by the two spelling groups in the Winnetka schools. The children who were taught by the completely individualized method learned on the average 1.30 words per day, while those taught by the partially individual method learned 1.04 words per day.

strictly individual method is in every case greater than those learned in the less individualized method.

It is unfortunate that the paired group experiments in spelling do not involve a comparison between individual and strictly class method. In both cases it is a completely individualized method versus a partially individualized method. One's natural assumption is that the strictly class method would make a still poorer showing, but there are no actual data to bear out this assumption. All that can be said with any definiteness is that there is a saving of time without a corresponding loss in spelling efficiency when one substitutes a completely individualized spelling method for one that is only partially individualized.

## SUMMARY

All the paired group experiments, in all four schools, and in both arithmetic and spelling, while differing in detailed results seem to point to these general conclusions:

1. *Where the same materials* are used (*i.e.,* materials specially prepared for individual instruction) both by children taught according to the class method and by children taught according to the individual method, we found no significant difference in the resulting achievement of the two groups.

2. The individual method results in a decided saving of time for the faster children.

# CHAPTER IX

## CONCENTRATION UNDER THE WINNETKA TECHNIQUE

Is the proportion of pupils apparently concentrated on their work greater or less when under the Winnetka technique than under ordinary class procedure?

This study was made by Mrs. Homer Rainey, the disinterested witness who was present at the giving of the tests in the coöperating schools. She followed the plan outlined by Professor Morrison of the University of Chicago.

Mrs. Rainey spent several periods visiting in the Winnetka schools and in School I. Owing to the lateness of the school year, which made it difficult to find work that was typical of the schools, the visits had to be limited. She stayed with each class for a period of about fifteen or twenty minutes. Classes were picked at random, except that the same grades were visited in Winnetka and in School I.

During each period she kept a record of the number of children in attention at every minute of the period. The records were handled statistically thus:

(1) The number of pupils in the group was noted.

(2) The length of the period was recorded.

(3) The number of pupils in the group was multiplied by the number of minutes in the period to get the *possible* pupil-minutes of attention.

(4) The numbers of pupils in attention at each of several minute-intervals of the period were added to give the total *actual* pupil minutes of attention.

(5) The number of *actual* pupil-minutes of attention was divided by the number of *possible* minutes of attention to give the per cent of attention for the group.

Below is a sample of the records kept for one group—a class in silent reading:

THURSDAY AFTERNOON, GRADE II, WINNETKA. NUMBER PUPILS, 21

| Time | Number in Attention | Time | Number in Attention |
|---|---|---|---|
| 2:07 | ..... | 2:17 | 19 |
| 2:08 | 21 | 2:18 | 19 |
| 2:09 | 21 | 2:19 | 21 |
| 2:10 | 18 | 2:20 | 21 |
| 2:11 | 20 | 2:21 | 19 |
| 2:12 | 20 | 2:22 | 19 |
| 2:13 | 19 | 2:23 | 21 |
| 2:14 | 21 | 2:24 | 20 |
| 2:15 | 21 | 2:25 | 21 |
| 2:16 | 20 | 2:26 | 19 |

Length of period, 19 minutes
Possible pupil-minutes of attention, 19 × 21 = 399.
Actual pupil-minutes of attention..... = 380.
Per cent of attention, 97.

Table XXXV is a complete record of the visits to the grades visited in Winnetka and in School I.

TABLE XXXV.—PERCENT OF ATTENTION IN WINNETKA AND IN SCHOOL I

Winnetka Schools

| Time of Visit | Grade | Length of Period | Number of Children in Group | Possible Pupil-minutes of Attention | Actual Pupil-minutes of Attention | Per cent of Attention | Remarks |
|---|---|---|---|---|---|---|---|
| A. M. | 2 | 20 | 23 | 460 | 375 | 82 | Arithmetic. |
| P. M. | 2 | 19 | 21 | 399 | 380 | 95 | Silent reading. |
| A. M. | 3 | 13 | 23 | 299 | 276 | 92 | |
| P. M. | 3 | 20 | 25 | 500 | 480 | 96 | Silent reading. |
| A. M. | 4 | 18 | 24 | 432 | 311 | 72 | |
| P. M. | 4 | 19 | 19 | 361 | 338 | 94 | Silent reading. |
| A. M. | 5 | 14 | 20 | 280 | 259 | 93 | Individual work. |
| P. M. | 5 | 18 | 27 | 486 | 446 | 92 | Individual language. |
| A. M. | 6 | 18 | 22 | 396 | 359 | 91 | Arithmetic. |

## School I

| Time of Visit | Grade | Length of Period | Number of Children in Group | Possible Pupil-minutes of Attention | Actual Pupil-minutes of Attention | Per cent of Attention | Remarks |
|---|---|---|---|---|---|---|---|
| A. M. | 2 | 22 | 33 | 726 | 679 | 94 | Reading and Spelling |
| A M. | 3 | 15 | 38 | 570 | 561 | 98 | Spelling. |
| P. M. | 3 | 22 | 39 | 858 | 857 | 100 | Silent reading |
| A. M. | 4 | 22 | 37 | 814 | 771 | 95 | Arithmetic |
| P. M. | 4 | 16 | 34 | 544 | 522 | 96 | Music. |
| A. M. | 5 | 18 | 34 | 612 | 598 | 98 | Spelling |
| P M. | 5 | 18 | 34 | 612 | 604 | 99 | Oral reading. |
| A. M. | 6 | 16 | 36 | 576 | 569 | 99 | Dictation. |
| A. M. | 6 | 23 | 36 | 828 | 805 | 97 | Spelling and writing |
| P. M. | 6 | 14 | 43 | 602 | 595 | 99 | Written Arithmetic. |

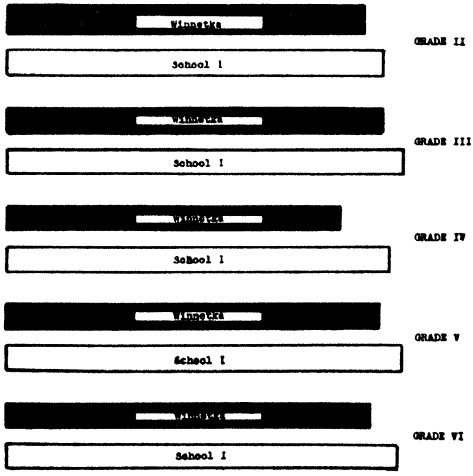



FIGURE XXXVII. AVERAGE PERCENTAGE OF CONCENTRATION FOR WINNETKA AND SCHOOL I

This graph shows the average per cent of concentration, grade by grade for Winnetka and for School I. Read the graph as follows: The average concentration for the second grade in Winnetka was 89, that for the second grade in School I, 94. The concentration for grade three was 94 for Winnetka and 99 for School I, etc.

The per cents of attention reported in Table XXXV, when averaged by grades, yield the following figures (see also Figure XXXVII):

| *Grade* | *Winnetka* | *School I* |
|---|---|---|
| 2 | 89 | 94 |
| 3 | 94 | 99 |
| 4 | 83 | 96 |
| 5 | 93 | 99 |
| 6 | 91 | 98 |

The per cents of attention, when averaged for all visits to each school, yield for Winnetka, 90; for School I, 97.5. The median attention for all visits is: Winnetka, 92; School I, 98.

Similar studies were made of the equal-parallel groups in the experiments conducted on individual versus class instruction. Six visits were made to each group in School III, with the results shown in Table XXXVI. Three visits were made to the equal parallel groups in the Winnetka schools with the results shown in Table XXXVII. Figure XXXVIII shows the average concentration for all visits, both in School III and in Winnetka.

TABLE XXXVI.—PER CENT OF ATTENTION OBSERVED DURING FOURTH-GRADE ARITHMETIC EXPERIMENT IN SCHOOL III

*Individual Instruction Group*

| Number of Visit | Length of Period | Number in Group | Possible Pupil-minutes of Attention | Actual Pupil-minutes of Attention | Per cent of Attention |
|---|---|---|---|---|---|
| 1 | 26 | 10 | 260 | 227 | 87 16 |
| 2 | 25 | 10 | 250 | 222 | 88 80 |
| 3 | 23 | 10 | 230 | 208 | 90 50 |
| 4 | 25 | 10 | 250 | 219 | 87 60 |
| 5 | 25 | 9 | 225 | 195 | 86 67 |
| 6 | 26 | 9 | 234 | 209 | 89.00 |
| Average | | | | | 88 29 |

*Class Instruction Group*

| Number of Visit | Length of Period | Number in Group | Possible Pupil-minutes of Attention | Actual Pupil-minutes of Attention | Per cent of Attention |
|---|---|---|---|---|---|
| 1 | 25 | 7 | 175 | 156 | 89 07 |
| 2 | 26 | 9 | 234 | 215 | 91.80 |
| 3 | 25 | 14 | 350 | 315 | 90.00 |
| 4 | 25 | 14 | 350 | 318 | 90 80 |
| 5 | 25 | 14 | 350 | 315 | 90.00 |
| 6 | 26 | 14 | 364 | 335 | 92 00 |
| Average | | | | | 90.61 |

TABLE XXXVII.—PER CENT OF ATTENTION OBSERVED DURING WINNETKA FOURTH-GRADE ARITHMETIC EXPERIMENT

*Class Group*

| Number of Visit | Length of Period | Number in Group | Possible Pupil-minutes of Attention | Actual Pupil-minutes of Attention | Per cent of Attention |
|---|---|---|---|---|---|
| 1 | 35 | 21 | 735 | 672 | 91 |
| 2 | 41 | 19 | 779 | 724 | 92 |
| 3 | 39 | 22 | 858 | 832 | 96 |
| Average | | | | | 93 |

*Individual Group*

| Number of Visit | Length of Period | Number in Group | Possible Pupil-minutes of Attention | Actual Pupil-minutes of Attention | Per cent of Attention |
|---|---|---|---|---|---|
| 1 | 37 | 15 | 555 | 487 | 88 |
| 2 | 41 | 16 | 656 | 557 | 84 |
| 3 | 39 | 15 | 585 | 552 | 94 |
| Average | | | | | 89 |

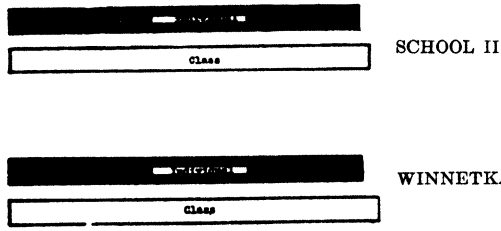



FIGURE XXXVIII. CONCENTRATION FOR THE TWO GROUPS IN ARITHMETIC EXPERIMENT

This graph shows percentage of concentration in the individual and in the class group of School III. The lower part shows the per cent of concentration group by group for the Winnetka arithmetic experiment. Read the graph as follows: The group taught individually had an average concentration of 88.29% while the group taught according to class instruction had an average concentration of 90.61%. Taking the Winnetka arithmetic experiment, the group taught according to individual technique had a concentration of 89%, while the group taught according to the class method averaged 93% in concentration.

The results of this study, while definite, are inconclusive because of the necessary limitations of the technique. They show a small, but remarkably consistent tendency of children working under the class method to be more uniformly at attention than

those working under the individual method. Of course, the question arises whether the fact that a child's eyes are on the teacher or his book indicates that he is really paying attention. Yet the fact that, comparing one Winnetka group with another, one School III group with another, and a series of Winnetka grades with a series of grades in School I, all yield the same type of result, makes one feel that there must be some common cause.

On the other hand, the two groups in School III were both doing practically the same type of work when compared—each child studying his own arithmetic lesson, and the various children doing different things—to all intents and purposes both were individual groups. The children in all grades at School I are accustomed to a much more formal type of discipline than those in Winnetka, which would easily account for the difference in the groups of classes compared. And the teachers in Winnetka whose two groups were compared had previously stated that one group contained children who were more restless and less concentrated than did the other.

Possibly individual work actually results in somewhat less concentrated attention than does class work. Such results as are here reported would indicate this, but the data are not adequate to justify any final conclusion in this matter. They present an interesting problem for further study.

# CHAPTER X

## GROUP AND CREATIVE ACTIVITIES

Do the pupils in the Winnetka schools devote more time or less time to group and creative activities than do those in the other schools studied? How is the time of the children spent, under the Winnetka technique and under that of the three other schools?

The Winnetka schools have been much better known for their technique of individualizing instruction and promotions than for any other feature of their work. On this account the question is often asked whether the work in the Winnetka schools is not largely mechanical and lacking sufficient opportunity for group and creative activities. It is asked whether the children in Winnetka receive the stimulus that comes from class discussions; whether they have opportunity to learn to work coöperatively in groups; whether, indeed, creative and self-expressive work has any place in the Winnetka plan.

In order to answer these questions the research worker made a careful comparison of the division of the child's time in Winnetka and in those schools with which Winnetka was compared in Chapters V and VII—a public school system (School No. I) similar in size and social composition to Winnetka's; a private experimental school (School No. II) particularly known for its group and creative activities; and a university laboratory school (School No. III). She spent two days in a 3d-grade, two in a 6th-grade, one day in a 4th and one in a 5th-grade room in each of the four schools studied.

The visits were made in the following order—first, a visit to a 3rd and 6th grade in each school; during the same month another visit to these same rooms, reversing the order of the visits; two months later a visit to a 4th-grade room in each of the four schools and two months later a visit to a 5th-grade room in each school. The teachers were, of course, not aware when visits were to be made.

On each visit the research worker stayed with the class from the beginning to the end of the school day. A record was kept of the *specific* activity engaged in by the majority of the class for every minute of the day, as far as this was possible. A slight disturbance was not recorded, since the main purpose of this study was to record child activities rather than class attention.

Activities during noon hours were not recorded. Comparisons during this period were impossible, since in two of the schools the children were at home and in the other two schools, they were either at the lunch room or in the yard. Recess periods were counted as part of the school day in all schools.

*After* the visits, the activities listed were classified under various headings as explained rather fully below.

### *I. Individual Work*

*Individual Study.* During a period of individual study each child is reading his own book, working on an assignment of his own or correcting his own work, which is not the same as the work of the rest of the class.

Examples: Each child is reading his own book at his own rate; they are hearing each other in pairs on combination cards; each child is working at his own rate in language, spelling, arithmetic, or science books.

### *II. Class Work*

*a. Class Study.* During a period of class study, each child is studying a lesson assigned to all.

Examples: Children are all working some assigned examples; they are studying some assigned pages in history or geography or reading; they are studying the notes of a song in preparation for singing; they are translating an assigned French letter.

*b. Class Drill.* Under this head come all quick drills or games for the purpose of increasing speed in applying knowledge already gained; also, writing exercises directed by the teacher.

Examples: The children are playing arithmetic or phonic games under the direction of the teacher; they are reading a French verse together for the purpose of memorizing it; they are playing games in French answering questions about the weather, the time, etc.; they are calling the answers to arithmetic combinations, in unison.

*c. Class Recitation (oral).* Oral recitation periods are periods when children are giving back to the teacher information gained through study. These recitations may or may not be on subjects in which the children are tested or graded. The majority of the class are listening as one recites.

Examples: The children are answering questions on a story read to them by the teacher; they are spelling assigned words, one by one, to the teacher;

they are answering questions on fractions and decimals; they are answering questions on marks in music; they are giving answers to arithmetic combinations; they are answering questions about a phonograph record played for them.

*d. Class Recitation (written).* Under written recitation come all lessons in which the children are writing answers to assigned questions in any subject.

Examples: The children are writing assigned spelling words from dictation; they are writing a poem dictated by the teacher; they are writing answers to questions put on the board.

*e. Listening to Instruction.* Under this head come periods when the children are listening to information given by the teacher.

Examples: The children are listening as the teacher tells them how to make shields; they are listening to the explanation of an arithmetic example; they are listening to the rules of a game; they are listening to a phonograph record for music appreciation; they are learning how to conduct a business meeting; they are listening to the teacher as she tells them about a viking ship, a musical composer, a trip, a history story, or birds.

### *III. Group and Creative Activities*

*a. Socialized Activities.* This heading includes all activities in which the whole class takes part—often prompted, but not directed, by the teacher.

Examples: The children are having a business meeting; they are dramatizing a play; they are playing games in teams, either in the gymnasium or on the playground; they are building a snow house; they are having a literary program prepared by the class.

*b. Self-expressive Activities.* Self-expressive activities are those activities which give the children an opportunity to express their own ideas. Articles to be made or stories to be written are often suggested by the teacher or other children, but in the working out of these stories or articles each child expresses something of himself.

Examples: Each child is writing an original poem; he is making an article of his own choice; he is showing the dramatic teacher how he would look if he were the cold North Wind; each child is playing by himself or they are playing in groups of two or three (a great many recess periods have been called "self-expressive" because free play has been counted as such); each child is drawing a picture of his own choice, working out his mat design or writing his own story.

*c. Directed Group Activities.* Under this head come activities in which the whole class takes part, but under the detailed direction of the teacher.

Examples: The children are singing songs together; they are all doing rhythms together; they are doing physical exercises; they are saying a prayer in unison; they are copying pictures from their books.

*d. Listening to Reports.* Book reports on books chosen by the children, reports on topics assigned to an individual child. A recitation of a poem by one child (his own choice) or an account of an experience of one of the children would be called a child's "report." During a period classed under this head, the majority of the class are listening.

*e. Recreation.* Examples: The children are visiting with each other; they are taking a sleigh ride.

*f. Entertainment.* Occasionally, there is a period given over to the entertainment of the children by grown-ups or by the children in other classes.

Examples: The children are listening to plays in assembly; they are listening as the teacher entertains them by reading a story.

*IV. Miscellaneous*

*a. Taking Directions.* During a period classed as "*Taking Directions*" the children are listening to directions on assignments, on school policies, or on any outside matters that may come up.

Examples: The children are taking dictation of problems to be worked; they are listening to a literature assignment; they are listening to directions on heading papers; they are listening to assembly announcements.

*b. Miscellaneous.* All other uses of time are classed as "Miscellaneous."

Examples: The children are getting papers, books, pencils, etc., ready for work; they are passing to and from classes; they are drinking milk; they are answering the roll call; they are changing their shoes; they are resting at their seats; they are listening as they are being disciplined.

All the activities carried on in each room visited fell under one or another of the above heads. Table XXXVIII shows the number of minutes spent in each of the main types of activity in each of the four schools.

The data in Table XXXVIII are in terms of minutes. As the total number of minutes in the school day varies for the schools studied, this method of summarizing is not altogether desirable.[1] A second table XXXIX, was therefore made, converting minutes spent by each class on each activity to a percentage of the total minutes spent by that class in school. These per cents were then averaged for the six visits and combined under the main headings. This table also combines the activities under the four main headings, individual work, class work, group and creative activities, and miscellaneous activities. Figure XXXIX shows the percentages summarized under the four main headings of this table.

The attempt at precise summing up of the division of time among various activities would, of course, be more accurate if

[1] Take the 5th-grade school day as an example. Here the school day of Winnetka was 329 minutes; that of School I was 293 minutes; that of School II was 321 minutes, and of School III, 313 minutes.

TABLE XXXVIII.—DISTRIBUTION OF TIME OF PUPILS TO INDIVIDUAL, TO CLASS, AND TO VARIOUS GROUP AND CREATIVE ACTIVITIES. COMPARISON OF WINNETKA WITH THREE OTHER SCHOOLS

(Average of Six Visits, in Number of Minutes)

| School | I | II | | | | | III | | | | | | IV | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Individual Study | Class Study | Class Drill | Oral Recitation | Written Recitation | Instruction | Social | Expressive | Directed | Reports | Recreation | Entertainment | Taking Directions | Miscellaneous |
| W | 100.33 | 4.0 | 8.0 | 10.3 | 0.3 | 12.8 | 61.3 | 38.8 | 15 | 11.8 | 4.8 | 2 | 11.0 | 38.0 |
| I | 18.00 | 50.5 | 20.3 | 58.0 | 11.8 | 12.8 | 7.3 | 21.5 | 25.0 | 2.5 | 1.2 | 0 | 10.3 | 43.0 |
| II | 31.33 | 33.6 | 2.3 | 58.0 | 1.8 | 41.8 | 44.5 | 31.2 | 27.2 | .6 | 2.0 | 16.8 | 11.8 | 49.2 |
| III | 41.67 | 46.3 | 5.2 | 31.6 | 6.2 | 12.3 | 30.6 | 38.5 | 31.5 | 5.8 | 1 0 | 1.2 | 16.0 | 45.6 |
| | Ind. Work | Class Work | | | | | Group and Creative Activities | | | | | | Miscellaneous | |
| W | 100.33 | 35.4 | | | | | 133 7 | | | | | | 49.0 | |
| I | 18.00 | 153.4 | | | | | 57.5 | | | | | | 53.3 | |
| II | 31.33 | 137.5 | | | | | 122.3 | | | | | | 61.0 | |
| III | 41.67 | 101.6 | | | | | 108.6 | | | | | | 61.6 | |

TABLE XXXIX.—DISTRIBUTION OF TIME OF PUPILS. DATA OF TABLE XXXVIII CONVERTED TO PERCENTS

| School | I | II | | | | | III | | | | | | IV | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Individual Study | Class Study | Class Drill | Oral Recitation | Written Recitation | Instruction | Social | Expressive | Directed | Reports | Recreation | Entertainment | Taking Directions | Miscellaneous |
| W | 31.5 | 1.2 | 2.6 | 3.2 | 0 0 | 4.2 | 18 8 | 11.8 | 5.0 | 4 0 | 1.5 | 0.6 | 3.6 | 11.8 |
| I | 6 3 | 17 6 | 7.5 | 20.5 | 4 0 | 4.3 | 2 5 | 7 8 | 9.2 | 0.8 | 0.3 | 0 0 | 3.8 | 15.2 |
| II | 8.5 | 9 6 | 0.6 | 16.6 | 0.5 | 11.6 | 12.8 | 8 6 | 7.5 | 0 3 | 0.6 | 4.8 | 3.5 | 14.0 |
| III | 13.0 | 14 3 | 1.8 | 10 3 | 2.0 | 3 8 | 9.8 | 12.5 | 10.2 | 1 8 | 0.5 | 0.3 | 5.0 | 14.5 |

| | Ind Work | Class Work | Group and Creative Activities | Miscellaneous |
|---|---|---|---|---|
| W | 31 5 | 11.2 | 41 7 | 15.4 |
| I | 6 3 | 53.9 | 20 6 | 19.0 |
| II | 8.5 | 38.9 | 34.6 | 17.5 |
| III | 13 0 | 32.2 | 35.1 | 19 5 |

it had included records for more than six days in each school and if it had been undertaken by a group of observers instead of one. Even the scattering of the visits over four grades and over several months does not secure really adequate sampling; nor does the plan of having one person list the specific activities in detail,

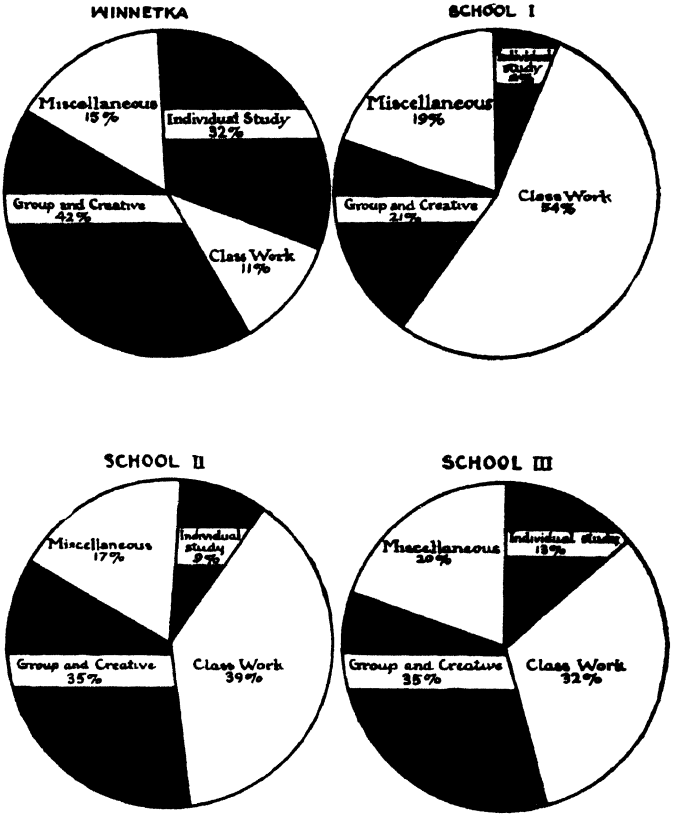



FIGURE XXXIX. DIVISION OF CHILDREN'S DAY IN THE FOUR SCHOOLS STUDIED

**This graph shows the percentage of time spent by the children in the four different schools in the following activities: individual study, class work, group and creative activities and miscellaneous activities. These figures are taken from Table XXXIX and are averages of the six visits in percentages of the number of minutes in the school day. Read the graph as follows: Winnetka children spent 32% of their day on individual study, 11% of their day on class work, 42% of their day on group and creative activities and 15% of their day on miscellaneous activities. The children in School I spent 6% of their day on individual study, 54% of their day on class work, 21% of their day on group and creative activities and 19% on miscellaneous activities, etc.**

minute by minute, throughout each day, do away entirely with the element of fallible personal judgment. The results of this study, therefore, cannot be considered as quantitatively exact—indeed, no exact results could be obtained under any conditions, for the schools themselves change their emphasis from time to time and grade to grade.

The general outcome of the results, however, is probably of real significance. Thus, there may be doubt as to whether School III really spends a little more time on group and creative activities than School II (the quantitative difference is too small to be significant), but there can be no doubt that School I is spending much less time on these activities than either Winnetka or Schools II and III. Similarly, School I is certainly spending much more time on strictly class activities than any of the others, while Winnetka is quite evidently spending the least time on class work and by far the most time on individual work.

The main question which this study set out to answer—Does the Winnetka technique result in a curtailment of group and creative activities?—is answered by an emphatic *no*. Quite the contrary, more provision appears to have been made for group and creative work in Winnetka than in any of the schools studied. The difference between Winnetka and Schools II and III is not especially significant—but these two schools, especially School II, have been noted for their emphasis on socialized and self-expressive work. The difference between Winnetka and the other public school system studied (School I) is very pronounced in this regard.

It should be noted here that the other public school system (I) was Winnetka's closest rival in academic achievement, making, for the most part, a distinctly better record than Schools II and III. This study of time distribution would certainly suggest that School I has achieved its academic excellence at the expense of group and creative activities. It would also suggest that Schools II and III have emphasized such activities somewhat at the expense of academic achievement. *The Winnetka technique,*

*on the other hand, appears to be providing ample group and creative activities without a loss in academic subjects.*

The results secured through the group and creative activities and the *quality* of these activities have not been measured. It is quite possible (in fact it is our personal opinion) that the group and creative activities in School II are in some cases much better organized than in Winnetka. Similarly, the 20.6 percent of the day spent on group and creative activities in School I, indicates a greater attention to these than was really given, since about a third of the time so classified consisted of unorganized recess periods, in which all the children were simply turned loose on an unsupervised playground—this is in contrast to the carefully supervised play and physical education periods in Winnetka, participated in by only one or two grades at a time. Much, therefore, remains unmeasured in this study, yet it seems justifiable to conclude that the Winnetka technique of individual instruction results in an increase, rather than a decrease, of time for group and creative activities.

## *Conclusion*

The Winnetka schools appear to spend a slightly larger proportion of time on group and creative activities than do Schools II and III and a very much larger proportion of time on them than does the other public school system (I). A problem for further investigation relates to the quality and effectiveness of the group and creative activities in each of these schools.

In general, Winnetka spends the largest proportion of time on individual work, the largest proportion of time on group and creative activities and the smallest proportion of time on class work, of all the schools with which Winnetka was compared.

# CHAPTER XI

## OUTSIDE WORK DONE BY TEACHERS

Does the Winnetka technique impose a greater burden on the teacher than does regular classroom instruction?

The purpose of this study was to find out whether individual instruction has increased the teacher's work in keeping records of children's work, preparing lessons and materials, and correcting children's work.

The following directions were given to each teacher in grades three through six in the schools studied: i. e., Winnetka, and Schools I, II, and III.

Fill in the record below for two weeks. Record the number of minutes you spend each day before school hours, after school hours, at recesses and at noons on

1. keeping records of children's work;
2. preparing lessons and materials;
3. correcting children's work.

| | M | T | W | Th | F | M | T | W | Th | F |
|---|---|---|---|---|---|---|---|---|---|---|
| Records | | | | | | | | | | |
| Preparation | | | | | | | | | | |
| Correction | | | | | | | | | | |

If you have assistance on this work, total that time spent with your own.

The total number of minutes spent by each teacher for two weeks (10 days) on each of the three activities was found and this total was divided by 10 to give the average number of minutes spent per day.

Below is a sample record submitted by a 6th-grade teacher in School III.

| | M. | T. | W. | Th | F. | M. | T | W. | Th. | F | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Records . . . | 30 | 20 | 30 | 45 | 0 | 15 | 20 | 15 | 30 | 30 | 235 |
| Preparation . | 30 | 30 | 30 | 30 | 20 | 45 | 30 | 30 | 60 | 20 | 325 |
| Correction.. .. | 60 | 120 | 120 | 60 | 120 | 120 | 120 | 120 | 150 | 150 | 1140 |

Dividing the totals by 10, we get for this teacher as average number of minutes per day: on records, 24; on preparation, 33; and on correction, 114.

In the Winnetka schools and in School I, since there were several classrooms for each grade, the averages for the several teachers of any one grade were averaged for that grade.

Table XL gives the average number of minutes spent each day, by grades and schools.

TABLE XL.—TIME SPENT PER DAY BY TEACHERS OF WINNETKA AND OF THREE OTHER SCHOOLS IN CERTAIN 'OUTSIDE' WORK*

| Work | Grades | Winnetka | I | II | III |
|---|---|---|---|---|---|
| Records | 3 | 22 | 12 | 0 | 180 |
| | 4 | 27 | 12 | 14 | * |
| | 5 | 24 | 17 | 43 | 120 |
| | 6 | 47 | 10 | 64 | 24 |
| Preparation | 3 | 19 | 27 | 284 | 60 |
| | 4 | 48 | 32 | 164 | |
| | 5 | 41 | 25 | 43 | 30 |
| | 6 | 39 | 15 | 45 | 33 |
| Correction | 3 | 31 | 17 | 105 | 60 |
| | 4 | 39 | 23 | 51 | |
| | 5 | 29 | 27 | 29 | 90 |
| | 6 | 71 | 10 | 233 | 114 |

*The 4th-grade teacher in School III could not do any outside work during these two weeks because of eye trouble.

In School II each teacher has an assistant and the total time in that school (for Grades 3, 4, and 6) represents the work of two teachers.

Let us now summarize these results. Take as an example the time spent by the Winnetka teachers on keeping records. In the third grades, the average was 22 minutes; in the fourth, 27 minutes; in the fifth, 24 minutes and in the sixth, 47. The average time spent by these four grades is 30 minutes.

The averages for all grades and schools are as follows:

| | Winnetka | I | II | III |
|---|---|---|---|---|
| Records | 30 | 13 | 30 | 108 |
| Preparation | 37 | 25 | 134 | 41 |
| Correction | 43 | 19 | 105 | 88 |
| Total | 110 | 57 | 269 | 237 |

The graph, Figure XL, shows these figures.

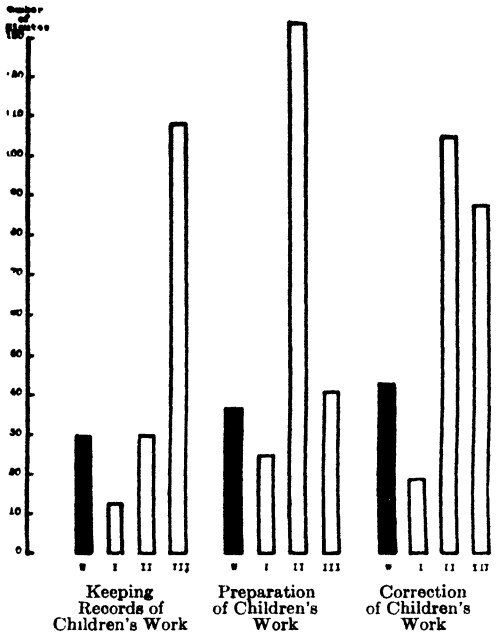



FIGURE XL. OUTSIDE WORK DONE BY TEACHERS

**This figure gives the average number of minutes spent each day by the teachers in the four schools on keeping records, preparation of work, and correction of children's work. Read the graph as follows: Winnetka teachers on the average spend 30 minutes a day on keeping records. The teachers in School I spend 13 minutes a day, those in School II spend 30 minutes a day, and those in School III, 108 minutes on records. The Winnetka teachers spend on the average 37 minutes a day in preparation of work, while the teachers in Schools I, II and III spend 25 minutes, 134 minutes and 41 minutes a day, in preparation, etc.**

School I requires a total of about one hour a day of outside work on the part of its teachers; Winnetka, about two hours; School III, nearly four hours; and School II, about four and a half hours.

School I is probably fairly typical of public schools generally. If this is true, the Winnetka technique is involving a larger demand on the teachers than is customary in public schools. With a five-hour school day, however, two hours of outside work, part of which may even be done during recess periods within the five hours, is not an exhorbitant demand.

As compared with Schools II and III, which emphasize special activities, socialized work, and experimental education in much the same manner as does Winnetka, the Winnetka technique is placing surprisingly little burden on its teachers. A somewhat detailed comparison here is enlightening.

In the keeping of records, School III, the University laboratory school, requires over three times as much time as any of the other schools. This is natural and probably quite justifiable. Winnetka and School II each require about half an hour a day for records; School I only thirteen minutes. It is evident that record keeping for individual instruction is not onerous. The Winnetka schools are laboratory schools and are attempting to keep an accurate record of all results as well as children's individual progress. That this involves on the average only half an hour a day per teacher is rather surprising.

In the preparation of work for the children School II is the 'high' one, averaging over two hours per day per teacher in this regard. The excellence of the projects carried on in that school, which is famous for the high quality of its socialized work, may justify this large amount of time. It is an experimental school and specializes in its socialized activities. Chapter X showed that it did not give more time to such work than Winnetka and School III. However, it is quite possible that it has achieved an excellence of quality not measured by this comparative survey, but resulting in part from the hours of daily preparation by the teachers. School III requires slightly more outside preparation of work than does Winnetka, and School I about twelve minutes less per day.

The correction of children's work occupies, roughly, an hour and a half per day in Schools II and III, and about half as much time (43 minutes) in Winnetka. The average teacher in School I manages, apparently, to do all her correction in less than twenty minutes per day.[1]

[1] The question has been raised whether correction of work might not have been done in the classroom during regular school time by some of the teachers. The research worker who made the detailed studies reported in Chapter X states that there was practically no correction of children's work when the class was present in any of the schools studied.

*A priori,* one would not expect much time for correcting children's work in Winnetka. The Winnetka technique involves pupil self-correction on all practice work, but it also involves frequent tests which must be corrected by the teacher. This correcting of tests, however, could not average 43 minutes per day; that time is accounted for by the fact that many Winnetka teachers are not satisfied to let the children's self-correction of their daily practice work go unchecked. These teachers insist on checking over the practice work after the child has corrected it.

In the correcting of children's work, therefore, Winnetka teachers give more outside time than do those of School I, but, as in the case of record keeping and preparation of materials, their outside work is much less than that of the teachers of Schools II and III.

## Conclusion

All things considered, Winnetka does require more outside work on the part of its teachers than does the typical public school, though much less than the other schools with which it is compared and which resemble Winnetka in their emphasis on social and self-expressive work and on accurate records of educational experimentation.

# CHAPTER XII

## COSTS

Is the system of individual instruction and progress responsible for the per capita cost in the Winnetka public schools, which is higher than that in most public schools?

In order to help answer this question a graduate student at the University of Chicago, R. D. Judd, was induced to take as the subject for his master's thesis: "A study of current expenditures for the elementary schools in three Illinois cities," in which he compared Winnetka and its neighbors to the north and south, Glencoe and Wilmette.

Unfortunately, much of the time and energy of Mr. Judd was spent in working out matters which had relatively little to do with the question of individual instruction, but we shall devote the next few pages to quoting from his thesis the portions that are germane to our own inquiry.

### *Purpose of the Study*

> The purpose of this thesis is to set forth comparable data relative to the current expenditures for the elementary schools of three Illinois towns, and to endeavor to make a comparative study with respect to the per pupil cost in general control, instruction, operation, maintenance, fixed charges, health activities, and other expense...

### *Definitions*

> *The Fiscal year,* regarded as the basis of this study, begins July 1, 1922, and ends June 30, 1923.
>
> *Per Capita Cost,* used in this thesis, means the cost per pupil for expenditures classified as follows: General Control, Instruction, Operation, Maintenance, Health Activities, Fixed Charges, Other Expense.
>
> *Current Expenditures* for the elementary schools include all expenditures for the purpose of carrying on the school program for the fiscal year, with the exception of expendi-

tures for capital outlay and that portion of expense designated as special assessments.

*Special Assessment* is the expense arising from an assessment made by the town for the purpose of building sidewalks or for the improvement of streets to which school property is subject.

*Capital Outlay.* The disbursement of monies for anything which increases the total amount of property possessed by the school system is classed in this study as capital outlay. The original investment on the building may be regarded as capital outlay, while all subsequent payments are to be regarded as upkeep due to depreciation.

*Fixed Charges* include all items such as rent for special classrooms and playgrounds, and insurance on equipment and building.

## A Description of the Three School Districts and Their System of Accounting

### *The Three School Districts*

The cities of Wilmette, Winnetka, and Glencoe are situated on the north side of Chicago in the exclusive residential section of the city, and can be reached in the order named above on going north over the elevated trains of the North Shore Line...

In Wilmette there are four buildings with an annual enrollment of 1,641 pupils and an average daily attendance of 1,331; in Winnetka, four buildings with an annual enrollment of 1,368 and an average daily attendance of 1,051; in Glencoe, one school with an annual enrollment of 605 and an average daily attendance of 454. Glencoe is situated in the largest school district of the three, has the greatest per capita wealth behind each child in average daily attendance, the least enrollment and population, while the district which comprises Wilmette has the smallest area, the largest population and enrollment, and the lowest per capita wealth behind each child in average daily attendance.

While Glencoe has the largest district area and the smallest population, attention should be called to the fact that the Skokie Marsh Lands, the Public Park, and the Country Club comprise a very large part of the area of the district. The school development in the three school districts probably has been largely influenced by the superintendents in

charge of each of the elementary schools. Superintendent Rowell has been at Glencoe 21 years, Superintendent Harper at Wilmette 15 years, and Superintendent Washburne at Winnetka 5 years.

### *The Basis for Distribution of Accounts For the Three Systems*

The financial records for the three elementary-school districts followed in the main the divisions outlined by the United States Bureau of Education as General Control, Instruction, Operation, Maintenance, Health Activities, Fixed Charges, and Other Expense. However, Winnetka had a somewhat more elaborate system of accounts than either Wilmette or Glencoe...

### *General Control*

The expense for general control for Winnetka amounted to almost twice the sum spent at Wilmette, and a little over two times the amount spent at Glencoe. The large expense at Winnetka can be accounted for in part by the fact that the salary paid the superintendent was about $900 larger than the amount paid the superintendent at Wilmette, and $1,400 more than the salary paid at Glencoe. In addition to the above expense there were two girls at Winnetka, the secretary and the bookkeeper, who were working full time in the office and a third girl who gave one-half of her time to clerical work in connection with the superintendent's office. At each of the other two cities there was only one office girl doing the clerical work for the superintendent.

Winnetka was the only system to make use of busses. The expense arising from the use of busses, which includes the drivers' salaries, gas, oil, grease, and rent for the garage, amounted to $1,589.82. Adding to this amount the superintendent's automobile expense of $235.00, it was found that a total of $1,824.82 was spent for machines for the year 1922-1923... Over $1,000.00 was spent in Winnetka for research work carried on in the system.

Many other items of expense were found in the Winnetka system which expenditures the systems of Wilmette and Glencoe did not have. Some of those listed were as follows: survey, $200.00; working fund, $218.94; prin-

cipal's August salary $150.00; dedication of Skokie building, $136.25; clerical work on tax books, $106.00; and expense of applicants, $100.75...

### *Instruction*

The following amounts were spent by the three systems for instruction: Winnetka, $109,014.59; Wilmette, $69,547.68; Glencoe, $52,264.02. The highest salaries paid in the three systems for teaching services were paid in Glencoe, while Winnetka ranked second, and Wilmette third.

Because of the "individual instruction" plan followed at Winnetka a great part of the expense for instruction, aside from the salaries of teachers, was incurred through the printing bills, the assembling of material for books, the large use of mimeographed material, and the purchase of supplementary readers... There are no textbooks used at Winnetka and the corresponding expense usually arising from such is found in the cost of mimeographed material, which item takes the place of the textbooks used in the ordinary system.

In diagram 41 attention should be called to the fact that out of every dollar spent by Winnetka for the expense of current operation, a little over sixty-four cents went for instruction, while at Wilmette the amount was sixty-six cents. At Glencoe sixty-eight cents were spent on the dollar for this service....

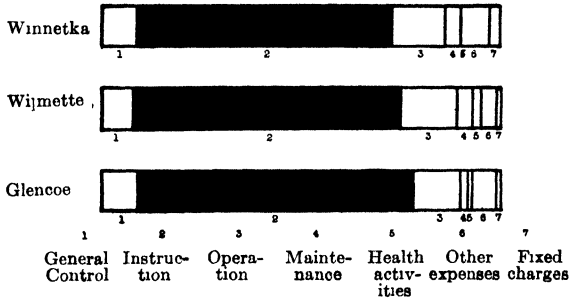



FIGURE XLI. WHERE THE DOLLAR GOES

**This figure shows the proportion of expenditures for Winnetka, Wilmette, and Glencoe to each classification listed in the lower part of this graph.**

### *Operation*

The three systems are spending about the same proportional amount for operation with respect to the total current expenditure: Winnetka spends 13.11 per cent; Wilmette, 14.03 per cent, while Glencoe is spending 12.39 per cent...

There is a difference in janitors' salaries for Wilmette and Winnetka of something over $2,000. This is due in part to the fact that the system at Winnetka has four separate buildings to be cared for, while at Wilmette there are in reality only three, since two of the buildings are operated as one plant. The systems are the same size with respect to buildings, although there are about 300 more pupils at Wilmette than there are at Winnetka...

Winnetka is spending about $5,000 more for coal during the year than Wilmette is spending. Just why this is so the writer is unable to say, unless some of the expense is accounted for by the fact that at Wilmette two of the four buildings are heated by a central heating plant, while at Winnetka four plants are required for the four buildings in the system...

### *Maintenance*

In making comparisons and drawing deductions relative to the amounts spent for maintenance by the three systems whose expenditures are respectively: Glencoe, $702.70; Wilmette, $3,859.60; Winnetka, $8,475.45, the fact should be borne in mind that the most expensive items under maintenance, such as repairing, painting, and alteration do not appear in Glencoe's expenditures at all. The writer is of the opinion that there is no justification for stating that the amounts spent for maintenance in the above case would from year to year be about the same as listed. Granting that the three systems might be uniform in size and character, the same cost differences are likely to occur in any one particular year, but hardly would this wide difference in the amounts expended for maintenance be likely to occur over a period of years...

### *Other Expense and Fixed Charges*

Little comment is necessary regarding the amounts spent by each system for "Fixed Charges." Wilmette and Win-

netka each have four buildings and the amounts spent for insurance is about the same for these two systems. Winnetka has some extra expense, insurance on Ford car, $70.88, insurance on busses, $551.57, and the rental of a playground, $300. Outside of these extra expenses found at Winnetka, the three systems have a normal expense for fixed charges.

"In conclusion: . . . If there is an economic waste occurring, it is taking place in many ways other than through instruction. In the light of the facts as shown, the writer does not think that it is justifiable to say that the reason for the greater expense at Winnetka is the individual instruction plan. The expense item is due in part to the lack of an economic saving in the general overhead expense of its system in the various divisions. There seem to be grounds for the above statement, since Glencoe's per pupil cost for current expenditures is $167.10, while Winnetka's is $161.94, and the individual instruction plan is not followed at Glencoe as it is at Winnetka (see graph 42). Again, Glencoe is spending about 69 cents of each dollar for instruction, while Winnetka is spending a little over 64 cents. Winnetka spends per pupil for instruction $103, while Glencoe is spending $115 per pupil for the same service. . ."

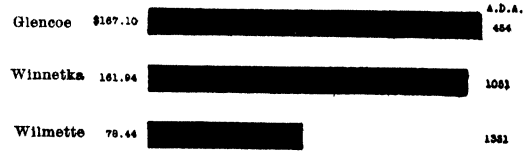


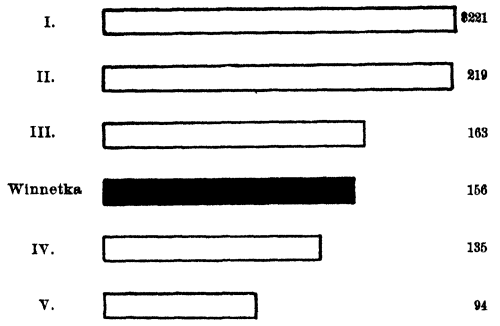

FIGURE XLII. WHAT EACH STUDENT COSTS

**This figure shows the cost per pupil for education in Glencoe, Winnetka and Wilmette. Read the graph as follows: It costs $167.10 for Glencoe to educate one pupil; the average daily attendance of Glencoe is 454. It costs Winnetka $161.94 to educate one pupil and Winnetka's daily attendance is 1,051. It costs Wilmette $78.44 per pupil and her daily attendance is 1,331.**

In order to bring Mr. Judd's study somewhat more up-to-date and to compare Winnetka with a larger number of similarly situated schools, a rough comparative study was made in the fall of 1924 of the budgets for the school year 1924-1925 of six North Shore communities: Wilmette, Kenilworth, Winnetka, Glencoe, South Highland Park (including Ravinia), and North Highland Park. These suburbs form an almost continuous chain,

running along the lake shore north from Evanston. All are purely suburban, with no industries of any size. All have a substantial number of comfortable homes and some homes of wealth. All except Winnetka use the class method of instruction.

The figures in the following table and graph XLIII give the comparative amounts planned for the year by the various schools.




XLIII. COMPARISON OF COSTS IN SIX NORTH SHORE SUBURBS

This graph shows the total per capita cost for each of the six North Shore suburbs listed in Table XL.

These figures are less accurate than Mr. Judd's, owing to the fact that they are based upon estimates for the fiscal year, and that the fiscal year in the different schools varies somewhat. Thus, Winnetka and Glencoe base their figures on the period from April 1, 1924, to March 31, 1925, while the other schools base their figures on the year beginning July 1, 1924, and running to June 30, 1925. These differences, however, are minor in their ultimate effect upon the analysis.

The Winnetka schools have one advantage in this table in that one of their school buildings—the Junior High School—was built by popular subscription, and that there are, therefore, no interest charges against this building. A building of ordinary type made to house the number of children now housed in this junior high school would, on the basis of other construction carried out in Winnetka during the past five years, cost approxi-

TABLE XLI.—COMPARISON OF WINNETKA WITH FIVE OTHER NORTH SHORE SUBURBAN SCHOOL SYSTEMS WITH SPECIAL REFERENCE TO COSTS

| | School I | School VII | Winnetka | School V | School IV | School VI |
|---|---|---|---|---|---|---|
| Enrollment, November 1 | 1,523 | 876 | 1,437 | 594 | 291 | 430 |
| Total No. Teachers | 51 | 36 | 68½ | 30.8 | 12 | 22.3 |
| No. Class Teachers | 42 | 29 | 49½ | 23 | 9 | 18 |
| No Special Teachers | 9 | 7 | 19 | 7.8 | 3 | 4.3 |
| Superintendent's Salary | $4,800 | $5,000 | Asst $4,200<br>Supt 6,600<br>$10,800 | $5,000 | $5,000 | $3,900 |
| Total Budget | $142,760 | $118,000 | $225,000 | $96,000 | $63,650 | $95,000 |
| Average Teacher's Salary | $1,586 | $1,839 | $1,824 | $1,950 | $1,871 | $1,920 |
| No Pupils per Special Teacher | 179 | 125 | 76 | 76 | 97 | 100 |
| No. Children per Class Teacher | 38 | 30 | 29 | 26 | 32 | 24 |
| Total Per Capita Cost | $94 | $135 | $156 | $162 | $219 | $221 |
| Total Per Capita per Teacher | $53 | $76 | $87 | $103 | $77 | $100 |
| Total Per Capita—Other Purposes | $38 | $53 | $62 | $52 | $125 | $112 |

mately $162,000.[1] Interest payments on these bonds at 4½ percent would amount to $7,290 a year. To offset this saving, the Winnetka Board of Education has the cost of maintenance and operation of school busses, which totals $2,744 per year and spends for the superintendent and assistant superintendent combined $10,800 as against $5,000, the maximum for any of the other suburbs compared. The total of these two amounts is $8,544. The additional cost of heating and operating this large junior-high-school building would still further offset the saving in bond interest and payments. The fact that the junior high school was donated instead of being built by a bond issue, therefore, does not modify the relative positions of the schools. Furthermore, the question of interest on bonds or of money set aside to retire bonds has to do with expenses quite aside from instruction. Both Mr. Judd's study and our Table XLI show that the *proportion* of money spent for various purposes is about the same in Winnetka as it is in other schools. This table, therefore, confirms Mr. Judd's table, in which Winnetka is shown occupying an intermediate position among three schools, since we here find Winnetka still occupying a middle position among six. It also confirms Mr. Judd's general conclusion that individual instruction is not increasing school costs in Winnetka.

The fact that retardation is lower in Winnetka than in the other schools means that there are actually fewer children in the schools to educate than would be the case if Winnetka had its full quota of repeaters. As shown in Chapter III of this monograph the average percentage of over-age children in the schools studied was 22.2 as against Winnetka's 14.4 Presumably, therefore, Winnetka has a somewhat smaller number of children in the schools to be educated than would be the case if there were the normal number of repeaters. The schools are, therefore, undoubtedly saving the cost of educating these repeaters.

[1] The actual cost of the Skokie School was $329,000. Had the board of education been obliged to build the building by a bond issue, it would have resorted to much less expensive construction, a much smaller assembly hall, and many other economies, as it has done with buildings erected both before and after the Skokie School.

## Summary

Two studies have been made of costs in the Winnetka schools, an elaborate one comparing Winnetka with two other North Shore suburbs for the school year 1922-1923, and a more recent, broader, less detailed one covering estimated expenditures for the school year 1924-1925 in Winnetka and five other North Shore suburbs. Both studies show Winnetka's cost to be about typical of other North Shore communities, being greater than some and less than others. Both studies show that there is no evidence that individual instruction is resulting in additional expense in the Winnetka schools. The age-grade census would indicate that individual instruction is at least saving the cost of re-educating repeaters.

# CHAPTER XIII

## GENERAL SUMMARY AND CONCLUSIONS

In summing up the entire study it is necessary to bear in mind certain facts. In the first place, the study is significant in so far as its findings would probably prove reasonably applicable to any school system which attempted adaptation to individual differences in accordance with the general principles of the Winnetka technique. In the second place, it should be clearly understood that the Winnetka Schools are constantly modifying and improving their technique, measuring the results of various experiments, and acting in accordance with their findings—one of the results of this very study will be the altering of some of the practices of the Winnetka schools. This study is like a snapshot of a moving object—the object is not in the same place when the photograph is developed. The basic principles of the Winnetka technique are relatively stable, but the detail is subject to much refinement.

The basic principles of the Winnetka technique may be summarized as follows: A clear re-statement of the common essentials curriculum in terms of units of achievement; complete diagnostic tests to measure this achievement; self-instructive, self-corrective practice materials to prepare for the tests; individual subject promotions on the basis of accomplishment; and ample time for group and creative activities.

There is clear evidence that the following advantages result from the individualization of instruction and progress in reading, arithmetic, spelling, and formal language, and the general technique of individual and social work as found in Winnetka:

1. The mastery of the drill phases of these subjects as measured by the tests used is better adapted to the varied capacities of individual children than is possible under the traditional class method.

2. Grade repetition is eliminated, in that no child repeats the work of a grade; retardation is markedly decreased; the pro-

portion of children making "normal" progress is increased; and there is a slight increase in the proportion of children accelerated.[1]

3. A greater amount of time per day is free for group and creative activities.

4. The efficiency of the work in reading, language, and arithmetic as measured by standardized tests is increased.

Question having arisen with regard to certain possible disadvantages, some of these have been subjected to careful investigation with the following results:

1. The ability of children trained by individual methods to hold their own in a high school taught by class methods appears to be demonstrated. Apparently, therefore, the total effect of individual work in the elementary school as measured by marks in high school is satisfactory.

2. The burden placed upon the teacher as a result of the individual technique is not onerous; it is somewhat greater than in the typical public school system, but decidedly less than in the private experimental school and the university laboratory school studied.

3. No additional cost appears to be involved. If the decrease in retardation is considered, there is an actual economy.

Disadvantages resulting either from the general plan or the detailed technique were, however, found in the following particulars:

1. The ability to spell words not studied was decidedly lower in Winnetka than in the other schools. While progress in this ability between September and February was slightly better in Winnetka than in the other schools, owing perhaps to a change in technique, the technique used prior to 1923 was undoubtedly ineffective in this particular.

2. If the appearance of attentiveness is an adequate criterion, there is a somewhat smaller percentage of children concentrating on their work under the individual instruction technique than under that of class instruction.

[1] It will be remembered that progress is based exclusively upon *measurable* achievement in reading, writing, language, history-geography, spelling, and arithmetic.

Among the results which as yet remain unmeasured and concerning which no conclusive statement can at this time be made are the following:

1. Is individual work in content subjects, such as history, geography, and science, as effective as it is in the 'tool' subjects of reading, spelling, formal language, and arithmetic?

2. Is the type of group and creative activities used in the Winnetka schools effective in producing the initiative, self-reliance, self-expression, and coöperativeness for which they exist?

3. Would a closer relationship between the individual work on the one hand and the group and creative activities on the other, increase or decrease the effectiveness of either?

4. How far can the advantages be increased and the disadvantages be decreased by further refinement of materials and technique?

5. In what proportion, if at all, will the advantages decrease and the disadvantages increase as the number of children in a class is increased?

6. Can the so-called 'fundamentals' be learned more rapidly and effectively as drill exercises apart from their natural setting?

7. Do pupils learn when to use facts and do they recognize their social significance as well when the facts are taught in individual self-corrective exercises as when introduced in their natural setting?

8. Do some pupils learn more effectively under the stimulus of group activities than when working alone?

These are samples of the types of problems which schools need to solve. The Winnetka schools will do their part in attacking them. Continuous experimentation is under way. But it is necessary for schools in many other places to set up experiments and contribute their share toward the answers.

Sufficient evidence has been adduced, not in Winnetka alone but in other schools and under differing conditions as well, to make it difficult to justify complacent adherence to traditional methods.

That the advantages and practicability of some such technique as that described herein are not confined to Winnetka is adequately attested by the other experiments that have been tried in the San Francisco State Teachers College, in the Detroit and Los Angeles public schools, at the University of Iowa, and in London, as well as by less accurately evaluated experiments in many other places. Typical ones of these are described in Part II of the *Twenty-fourth Yearbook of the National Society for the Study of Education,*[2] together with a summary of such statistical experiments as have been carried out in these various schools. It is significant that every experiment in adapting schools to individual differences, where it has yielded any statistical results, has tended to confirm one or more of the conclusions of this monograph.

While, therefore, much experimentation remains to be done, and wide coöperation is needed, it appears fair to conclude that it is possible for public schools to make much greater adaptation to individual differences than is customary, and that, so far as we have been able to measure the results of such adaptation, most of these results are good.

---

[2] Published by the Public School Publishing Co., Bloomington, Illinois, 1925, under the title, "Adapting the Schools to Individual Differences."